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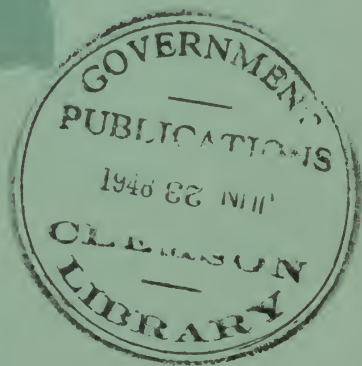


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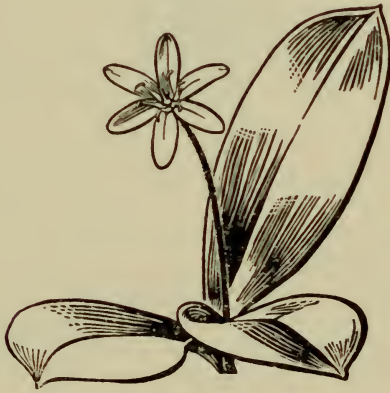
OF MOUNT
RAINIER
NATIONAL
PARK





Flora

OF MOUNT RAINIER NATIONAL PARK



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United States
Department of the Interior

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[NOTE.—Illustrations are the author's unless otherwise indicated in the captions given with the figures.]



Figure 1.—PACIFIC TRILLIUM (*Trillium ovatum*). Asahel Curtis Photo.



Flora OF MOUNT RAINIER NATIONAL PARK

Introduction

OF THE MANY REGIONS famous for floral beauty, few of like area excel Mount Rainier National Park, Wash., in abundance of flowers or in the number of individual species. One can best appreciate the reasons for this condition when the topography, geographic location, climatic factors, altitudinal range, and other allied features characteristic of the park are understood.

SIZE AND TOPOGRAPHY OF THE PARK

Mount Rainier National Park is 377.78 square miles (241,782 acres) in size or approximately one-third as large as the State of Rhode Island. The lowest point, 1,600 feet in elevation, is in the southeastern corner of the area where the Ohanapecosh River crosses the southern boundary. Columbia Crest, 14,408 feet, at the summit of Mount Rainier, is the highest point. The entire park is characterized by extreme ruggedness. The mountain itself is the main topographical feature. It lies just to the west of the center of the park, its huge base occupying approximately 100 square miles of territory or about one-third of the total area of the park. Surrounding this old volcanic cone is a mass of smaller peaks and minor mountain ranges averaging from 5,000 to 7,000 feet in height. With the exception of a portion of the Cascade Range, the crest line of which forms a part of the eastern boundary of the park, the principal ridges of prominence lie parallel to the glacial troughs which radiate from the mountain. Consequently, in encircling Mount Rainier, via the Wonderland Trail, one alternately climbs

to open subalpine meadows known as "parks" and descends to heavily forested valleys. Differences in elevation between these points are often in excess of 3,000 feet.

GEOGRAPHIC LOCATION AND CLIMATIC FACTORS

As Mount Rainier National Park lies entirely west of the crest line of the Cascade Range, which is a north-south climatic boundary in the State of Washington, its geographic position is largely responsible for its climate and, likewise, for the character of its vegetation. The prevailing winds are from the west and are heavily laden with moisture from the Pacific Ocean. As they rise in passing inland over the Cascades, rapid condensation of this moisture is brought about with consequent heavy precipitation, since air cools upon rising and thus loses its capacity for holding moisture. Topographic features account for variation in precipitation and, in general, windward slopes receive a greater amount of moisture than do leeward exposures. For this reason, although it is 900 feet higher, the Yakima Park (Sunrise) section of Mount Rainier National Park receives considerably less snowfall than does the Paradise Valley area, for the former is on the leeward side of Mount Rainier.

In general, however, the park, in common with other areas of like altitude west of the Cascades, is characterized by heavy precipitation. More than 75 percent of the total annual precipitation falls from October to May. According to records of the United States Weather Bureau, the average annual precipitation for Paradise Park (5,557 feet) is roughly 100 inches.¹ This may be contrasted with the record for Longmire (2,760 feet) where the average annual rate is about 78 inches.

In spite of its latitude, which is comparable to northern Maine, and its excessive snowfall, Mount Rainier National Park has comparatively mild winters. This is largely due to the proximity of the Pacific and the prevailing westerly winds. The summers in this region are, in turn, rarely characterized by hot weather for any extended period.

EFFECTS OF ALTITUDE ON PLANT LIFE

Just as differences in latitude are responsible for variations in climate with resultant changes in plant and animal life from the temperate to the arctic regions, so the changes in climate, which are the result of differences in elevation, cause certain characteristic variations in the flora and fauna of moun-

¹ Includes the annual snowfall for this region. At Longmire the average annual snowfall is about 15 feet, the maximum depth at any one time varying from 2 to 7 feet. At Paradise Park approximately 50 feet of snow falls annually, the maximum depth at any one time varying from 15 to 27 feet. While no records are available for Yakima Park, casual observations during the past decade indicate that although this point is 900 feet higher than Paradise Park the snowfall is considerably less; 10 to 15 feet is the usual maximum depth at any one time at Yakima Park.

tainous areas. This is readily apparent in a trip from Puget Sound, which lies within the Humid Transition Zone, to the upper slopes of Mount Rainier which are within the Arctic-Alpine Zone. A view of Mount Rainier from sea level at Puget Sound is equally good evidence of the changes in climate which occur with elevation. The great cone lifts its rugged crest far above the lesser mountains at its base, their heavily wooded slopes being sharply contrasted with the perpetually snow- and glacier-clad upper slopes of the great mountain which are indicative of the severity of the climate at those elevations. Thus, relatively speaking, Mount Rainier may be regarded as an "arctic island in a temperate sea." Consequently, the changes in the flora from the lower park boundaries to the upper slopes of Mount Rainier will be, broadly speaking, similar to those observed in traveling northward from Puget Sound to within the Arctic Circle. This is one reason for the diversity of plant forms within the borders of this comparatively small area.

There are four life zones within Mount Rainier National Park—the Humid Transition, Canadian, Hudsonian, and Arctic-Alpine. Differences in temperature and moisture in each of these altitudinal divisions bring about the development of certain plant associations by which each may be recognized. There is, on the other hand, considerable variation in the altitudinal distribution of many plants as the line of demarcation between the various zones is not always sharply defined and many plants are characteristic of two or more life zones.

Humid Transition Zone: In this zone one finds plant life that is similar to that which will be noted at sea level about Puget Sound. It is the zone of deep sombre forests which serve as the visitor's introduction to Mount Rainier National Park unless he enters the park via the Chinook Pass gateway from Yakima.

It is difficult to describe adequately this lowland forest. It is awe-inspiring in its quiet solitude; cathedral-like in its sombre, peaceful grandeur. So dense are the trees that their branches interlace overhead to form an evergreen canopy, and even on bright summer days a condition of semi-twilight exists on the forest floor. The great trunks rise from a tangled mass of shade-loving plants which, in places, approach tropical-like luxuriance. Other trees, leveled by age or the elements, sprawl upon the ground—some newly fallen, others festooned with moss, and some in the last stages of decomposition. The trails, carpeted by an accumulation of humus and forest litter, are soft and yielding to the tread.

The Humid Transition Zone extends from the lowest elevation of the park (1,600 feet) to about 3,000 feet, although on the west side of the area transition elements may sometimes be noted as high as 3,500 feet or even 4,000 feet. There is, however, no finely drawn distinction between the Humid Transition and Canadian Zones in the park. The upper limits of the former are merged with the lower limits of the latter and so in many localities at the lower elevations of the park many characteristics of both

zones may be observed. The overlapping of plants from one zone to another is more characteristic of the Humid Transition-Canadian than in any other. The modifying influence of the heavy forest cover, which in turn is largely due to the equable climate of this region, is no doubt responsible for the diffusion of zonal types in this instance.

Plants that may be found in the Humid Transition elements in Mount Rainier National Park, though they are by no means confined to such associations, are the following: Pacific bleedingheart (*Dicentra formosa*), stink currant (*Ribes bracteosum*), winter or redflowering currant (*Ribes sanguineum*), bitter cherry (*Prunus emarginata mollis*), Indianpipe (*Monotropa uniflora*), grand fir (*Abies grandis*), northern black cottonwood (*Populus trichocarpa hastata*), bigleaf maple (*Acer macrophyllum*), Pacific dogwood (*Cornus nuttalli*), Douglas-fir (*Pseudotsuga taxifolia*), western red-cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), Pacific trillium (*Trillium ovatum*), salal (*Gaultheria shallon*), Cascades mahonia or Oregon grape (*Mahonia nervosa*), western swordfern (*Polystichum munitum*), Pacific yew (*Taxus brevifolia*), beadruby or wild lily-of-the-valley (*Maianthemum dilatatum*), starry solomonplume (*Smilacina stellata*), claspleaf twistedstalk (*Streptopus amplexifolius*), threeleaf anemone (*Anemone deltoidea*), deerfoot vanillaleaf or sweet-after-death (*Achlys triphylla*), and Oregon oxalis or wood sorrel (*Oxalis oregana*).

Canadian Zone: As already stated, there is a considerable mixture of Humid Transition and Canadian elements at the lower elevations of the park. In fact, the Canadian Zone here does not become well defined until above the 3,000-foot level. While still heavily timbered, the forest of the Canadian Zone is composed of trees that are noticeably smaller than those at the lower elevations. Likewise, the forest is not so dense or so shaded, and the ground cover is more open in character. Although western hemlock (*Tsuga heterophylla*) and Douglas-fir (*Pseudotsuga taxifolia*) are common members of the forest in the lower portions of this zone, the most typical tree species are Pacific silver fir (*Abies amabilis*), Alaska yellow-cedar (*Chamaecyparis nootkatensis*), noble fir (*Abies procera*), and western white pine (*Pinus monticola*).

Insofar as the characteristic plants of the Canadian Zone are concerned, Piper² states: "The zone can, in fact, be recognized in Washington not so much by any purely characteristic species as by the great abundance of species relatively rare in the contiguous zones." In general this statement holds true in Mount Rainier National Park.

In addition to the species of trees already mentioned, the following plants are among those most often encountered in the Canadian Zone in this area: Queencup beadlelily (*Clintonia uniflora*), bunchberry dogwood (*Cornus*

² Piper, C. V. Flora of the State of Washington. Contributions from the United States National Herbarium, Vol. XI, 1906.

canadensis), Menzies pipsissewa (*Chimaphila menziesi*), Oregon winter-green (*Gaultheria ovatifolia*), rusty menziesia or fool's huckleberry (*Menziesia ferruginea*), and Cascades azalea (*Rhododendron albiflorum*).

Hudsonian Zone: Characterized by subalpine meadows in which are found groups of alpine fir and mountain hemlock, this zone, with an altitudinal range of from approximately 5,000 to 6,500 feet, is the region of greatest public interest in Mount Rainier National Park. It is a region of extensive panoramas, of rugged mountain grandeur softened by the verdant beauty of an open subalpine forest and an abundance of flowers of many vivid hues. For these reasons the Hudsonian Zone contrasts sharply with the heavily wooded Humid Transition and Canadian Zones.

The entire Hudsonian Zone is covered with snowdrifts during the greater portion of the year. As a rule, the first winter snow to stay on the ground falls about November 1 and the earth is only partly free of its ermine blanket by July 4. Extensive areas may remain covered with snow until past midsummer. In consequence, the growing season is short and intense. Many of the early plants of this zone, such as the avalanche fawnlily (*Erythronium montanum*), lambstongue fawnlily (*Erythronium grandiflorum* var. *pallidum*), and western pasqueflower or western anemone (*Anemone occidentalis*), begin their occupation of these meadows as fast as the snow melts. The avalanche fawnlily actually pushes through the edges of the retreating snowbanks. The massed effect of the flowers which makes these meadows so attractive and colorful is largely due to the short growing season, the abundant moisture from the melting snowbanks, and the warm rays of the summer sun. Many of the species found here are the same as, or quite similar to, those found in the Hudsonian regions of Canada and Alaska.

The flora of the Hudsonian Zone is generally constant in composition, except in the vicinity of Yakima Park (Sunrise). Here, no doubt due to the differences in precipitation and to the character of the soil, there is some difference in species content. The difference in species is most noticeable in the case of the trees, for whitebark pine replaces mountain hemlock as the most common associate of alpine fir. As there is considerably less snow in the Yakima Park area than on the south and west sides of the park, the plants in Yakima Park are generally earlier, insofar as their maximum abundance is concerned, and they disappear at an earlier date.

The following are characteristic plants of this zone: Alpine fir (*Abies lasiocarpa*), mountain hemlock (*Tsuga mertensiana*), whitebark pine (*Pinus albicaulis*), avalanche fawnlily (*Erythronium montanum*), lambstongue fawnlily (*Erythronium grandiflorum* var. *pallidum*), Eschscholtz falsehellebore (*Veratrum eschscholtzi*), American bistort or mountain dock (*Polygonum bistortoides*), western pasqueflower (*Anemone occidentalis*), elkslip marshmarigold (*Caltha leptosepala*), mapleleaf currant (*Ribes acrifolium*), Alaska spirea (*Luetkea pectinata*), fanleaf cinquefoil (*Potentilla*

flabellifolia), subalpine spirea (*Spiraea densiflora*), subalpine lupine (*Lupinus subalpinus*), Mertens cassiope or white heather (*Cassiope mertensiana*), red mountainheath (*Phyllodoce empetriformis*), cream mountainheath or yellow heather (*Phyllodoce glanduliflora*), delicious blueberry (*Vaccinium deliciosum*), Jeffrey shootingstar (*Dodecatheon jeffreyi*), Rainier pleated or blue gentian (*Gentiana calycosa*), spreading phlox (*Phlox diffusa*), skunkleaf polemonium or Jacobs ladder (*Polemonium pulcherrimum*), scarlet paintedcup (*Castilleja miniata*), magenta paintedcup (*Castilleja oreopola*), Lewis monkeyflower (*Mimulus lewisi*), tricolor monkeyflower or alpine yellow mimulus (*Mimulus tilingi*), sickletop pedicularis or common lousewort (*Pedicularis racemosa*), bracted pedicularis or Indian warrior lousewort (*Pedicularis bracteosa*), cliff penstemon (*Penstemon rupicola*), Cusick speedwell (*Veronica cusicki*), Sitka valerian (*Valeriana sitchensis*), bluebell (*Campanula rotundifolia*), broadleaf arnica (*Arnica latifolia*), and aster fleabane (*Erigeron salsuginosus*). Englemann spruce (*Picea engelmanni*) is often found in the Hudsonian Zone on the north side of the park.

Arctic-Alpine Zone: This zone includes all of that area above the upper limit of tree growth, which may be generally considered to mark the upper limit of the Hudsonian Zone. Thus its altitudinal range is from about 6,500 feet to the summit of Mount Rainier itself at 14,408 feet. Only the lower portions of this zone are inhabited by plant life, for a great part of the area is characterized by barren, rocky soils, perpetual snowfields, or glacial ice. The majority of flowering plants in this zone occur at elevations of from 6,500 to 7,500 feet. A few species may be found, under proper conditions, up to 10,000 feet, and several species of mosses and lichens inhabit the rocks of the crater rim (approximately 14,300 feet) which are warmed by vapors that escape from fissures at that point.

This is a region of rugged mountain grandeur and, although it lacks the verdure of the Hudsonian meadows, its pioneer floral types are of considerable interest. The soil is shallow and rocky. The growing season is short, with frequent nightly frosts and even light snowfalls. The temperature varies considerably between night and day and also between sunlight and shade. These and related factors restrict the plants of this rigorous zone to perennials.

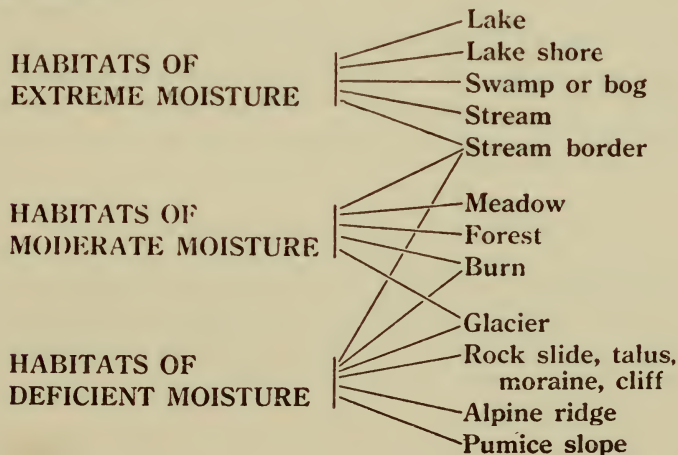
No distinct line can be drawn between the Hudsonian and Arctic-Alpine Zones. The change is one of gradual transition with altitude. Characteristic plants of the Arctic-Alpine Zone are: Oarleaf eriogonum or mountain buckwheat (*Eriogonum pyrolaeifolium*), Mount Hood pussypaws (*Spraguea candicifera*), moss silene or moss campion (*Silene acaulis*), willow grass (*Draba aureola*), smelowskia (*Smelowskia ovalis*), Tolmie saxifrage (*Saxifraga tolmiei*), Lyall lupine (*Lupinus lyalli*), alpine Jacobs ladder (*Polemonium pilosum*), Northwestern paintedcup or Indian pink (*Castilleja angustifolia*), and gold fleabane (*Erigeron aureus*).

In the Yakima Park area, near Frozen Lake and along the Burroughs Mountain loop trail, may be found one of the most colorful of the mountain's Arctic-Alpine rock gardens. Here one finds a considerable quantity of Northwestern paintedcup, Lyall lupine, gold fleabane, and several other plants growing upon the dry, rocky or pumice soils. This is one of the most colorful and interesting floral associations in the park and may be generally seen at its best about the first week in August.

HABITATS AFFECTING PLANT LIFE IN MOUNT RAINIER NATIONAL PARK

Throughout the park localized conditions, largely determined by soil and moisture, account for the development of certain plant associations within the various life zones. The term "habitat" refers to the natural environment of plants. For instance, certain plants will establish themselves in boggy soils, others prefer dry pumice soil, while some are found most often in the shaded depths of the forest. Thus plants have certain characteristics by which they are adapted to certain environments and which enable them to establish themselves, maintain their position with respect to their associates, grow, and reproduce under those conditions. Certain features possessed by a plant may be of particular advantage in one environment but of disadvantage in another.

Habitats within life zones may be classified as follows on the basis of available moisture:



Although moisture is probably the major factor, others, such as the character of the soil, exposure (whether north, south, east, or west slope), and sunlight, must be taken into consideration. While these are not definitely brought out in the foregoing diagram, they may be readily inferred. For instance, a pumice slope is usually characterized by abundant sunlight, whereas a forest habitat, especially in the Transition and Canadian Zones,

is shaded. The borders of the large glacier-fed streams, such as the Nisqually, White River, and others, may be characterized by any one of those conditions of moisture noted in the diagram. In such cases the stream borders are generally rocky river bars which, while they may be places having extreme moisture or moderate moisture, are generally composed of very dry sandy or rocky soil. This is not true of most of the smaller streams, however. The borders of these are characterized by extreme moisture and generally support plants that prefer such a habitat. Burned areas are most often characterized by dry soil. The glacier habitat, though classed as one of moderate moisture, is more properly considered as deficient in moisture as the water present is generally unavailable to plants. Several species of snow algae inhabit the snowfields and certain portions of the glacier habitat. The best known and most conspicuous of these is the Red Snow (*Chlamydomonas nivalis*).

Although one or two of the habitats listed may be more common in some particular life zone, none is strictly confined to the limits of one zone. Most habitats will be noted in all four zones and wherever found they will generally support a plant community consistent with the limitations of the particular zone in question. For instance, the plants of boggy situations in the Transition Zone elements include the upland starflower (*Trientalis arctica*), American yellowskunkcabbage (*Lysichitum americanum*), round-leaf sundew (*Drosera rotundifolia*), Menzies spirea (*Spiraea menziesi*), tuber waterhemlock (*Cicuta vagans*), and bearberry honeysuckle (*Lonicera involucrata*). On the other hand, boggy soils in the Hudsonian region support such plants as the elkslip marshmarigold (*Caltha leptosepala*), Jeffrey shootingstar (*Dodecatheon jeffreyi*), and bog kalmia or swamp laurel (*Kalmia polifolia* var. *microphylla*). Similar differences in the plant population will be found in other habitats that occur in two or more life zones.

FEATURES OF MOUNT RAINIER'S FLORA

Generally speaking, the flora of Mount Rainier National Park is similar to that of other areas at similar elevations in western Washington. There are, however, several plants that are found only in Mount Rainier National Park, while others, common elsewhere, are not members of the local plant population.

The earliest plants to bloom are usually noted at the lower elevations of the park during the latter part of April and the first portion of May. From that period until early fall there is a continual succession of floral interest. As the seasons advance, spring and summer conditions progress upward to the higher elevations. Hence it is possible to find many of the early spring plants in bud or in full bloom at 4,000 or 4,500 feet in midsummer when the same species have long since disappeared at the lower elevations.

The distinction of being the first plant to bloom in Mount Rainier National Park is shared by two species—the butterbur or coltsfoot (*Petasites speciosus*) and the American yellowskunkcabbage (*Lysichitum americanum*). Most often the butterbur is first, but occasionally the American yellowskunkcabbage leads the floral parade, this being dependent upon the climatic conditions of the season in question. Thus the butterbur, which is neither an attractive nor well-known plant, gains considerable prominence.

As a rule, the flowers characteristic of the deep forests are at their best during July, although many interesting plants may be seen in the woods in late May and June. These plants of the heavily wooded Humid Transition and Canadian Zones embody many features of interest, though they are not so generally known or appreciated as the flowers of the Hudsonian and Arctic-Alpine Zones, largely because the latter offer a more striking effect en masse. The species typical of the deep woods, however, outnumber those characteristic of the upper elevations and many have a striking individual beauty.

With the exception of the delicious blueberry (*Vaccinium deliciosum*), which has a fruiting period that is well known and appreciated, the plants of the subalpine meadows claim attention solely because of the glory of their massed color during midsummer. Many of the plants of the deep woods, on the other hand, are as attractive in fruit as they are in flower. It is during the latter part of August that visitors are attracted by the brilliant red berries of the Pacific red elder (*Sambucus callicarpa*), American devilsclub (*Oplopanax horridus*), and the bunchberry dogwood (*Cornus canadensis*). The beautiful turquoise fruit of the queencup beadlily (*Clintonia uniflora*) found at that time is as interesting as its single white blossom of early spring, and the green fruit of the starry solomonplume (*Smilacina stellata*) with the characteristic dark brown stripes, is another of the many examples of botanical interest in the deep wooded regions in the late summer.

In the Hudsonian meadows, mid-June usually ushers in the flower season. At that time the first patches of earth are beginning to show through the snowdrifts. Often one will find avalanche fawnlilies blooming about the edges of receding snowbanks. Other early plants common at this elevation are the lambstongue fawnlily, western pasqueflower, and elk-slip marigold. The growing season here is so brief that plants must bloom and bear fruit within a few weeks. As the season advances and the snow continues to disappear these "islands" of flowers enlarge until great masses of these early plants have taken over the meadows. These early flowers give way to later varieties which are, generally speaking, more colorful. It is generally the last week in July and the first week in August before one finds these meadows at the height of color and variety. So there are, in reality, two periods during the summer when the floral display of the Hudsonian meadows is most striking. The first occurs late in June and early in July

as the early plants take over the meadows from the rapidly receding snowbanks; the second is in late July and early August when later plants tint these meadows in a riot of color. Often in late summer, where the shade of a clump of trees has retarded the melting of a snowbank, one may find groups of "early" flowers entirely surrounded by those characteristic of the later season. The reverse may be true where some knoll has been freed of snow earlier than the area immediately surrounding it. Thus the flora of Mount Rainier National Park continues to exhibit interest and variety from the time the humble butterbur makes its appearance at the lower elevations in April or early May, until early September. The last of the flowers to come into bloom is the Rainier pleated or blue gentian which generally makes its appearance about mid-August and remains until mid-September.

NUMBER OF FLOWERING PLANTS NATIVE TO MOUNT RAINIER NATIONAL PARK

In addition to the ferns and fern allies (Pteridophytes) there are almost 700 species of flowering plants in Mount Rainier National Park. This number includes representatives of 64 families. The family having the greatest number of local representatives is the composite or sunflower family (Compositae) for which 84 species are listed. Second comes the grass family (Gramineae) with 69 species. Others of importance are the rose family (Rosaceae), 39; heath family (Ericaceae), 38; saxifrage family (Saxifragaceae), 36; figwort or snapdragon family (Scrophulariaceae), 37; sedge family (Cyperaceae), 37; mustard family (Cruciferae), 27; pink family (Caryophyllaceae), 29; lily family (Liliaceae), 21; and the buttercup family (Ranunculaceae), rush family (Juncaceae), and pine family (Pinaceae) each with 16 representatives.

EARLY BOTANICAL EXPLORATIONS

The visit of the first white man to the area now known as Mount Rainier National Park was prompted by a desire to make botanical collections. Dr. William Fraser Tolmie, a surgeon of the Hudson's Bay Co., made a "botanizing expedition" into the region in 1833 and, on September 2 of that year, "collected a vasculum of plants" on a mountain in the northwest corner of the park which, in his honor, has been named Tolmie Peak.³

Early in the nineties Prof. O. D. Allen, who had been on the faculty of Yale University, came west on account of his health and settled in the Nisqually Valley a few miles below the present Nisqually Entrance to the park. He made extensive collections in the upper Nisqually Valley from 1895-1905. Dr. Charles V. Piper collected in the park area in 1888, 1889, and 1895. His article on the flora of Mount Rainier, which appeared in

³ Meany, E. S. Mount Rainier—A Record of Exploration. 1916.



Figure 2.—AIR VIEW OF MOUNT RAINIER WITH BASE OBSCURED BY SEA OF CLOUDS.

Figure 3.—MOUNT RAINIER FROM CREST OF RAMPART RIDGE. ILLUSTRATES CHANGES IN CHARACTER OF VEGETATION WITH ELEVATION FROM HEAVILY WOODED HUMID TRANSITION ZONE AT LOWEST PARTS OF KAUTZ CREEK VALLEY (LEFT FOREGROUND) TO ARCTIC-ALPINE ZONE AT HIGH ELEVATIONS ABOVE TIMBER LINE.





Figure 4.—ON INDIAN HENRY TRAIL NEAR LONGMIRE. ILLUSTRATES CHARACTER OF FOREST OF HUMID TRANSITION ZONE. LARGE TREES WITH DEEPLY RIDGED BARK ARE DOUGLAS-FIR (*Pseudotsuga taxifolia*) ; SMALLER SPECIMENS WITH SCALY BARK ARE WESTERN HEMLOCK (*Tsuga heterophylla*) ; STILL SMALLER TREES WITH LIGHT, SMOOTH BARK ARE PACIFIC SILVER FIR (*Abies amabilis*).



Figure 5.—TRAIL TO REFLECTION LAKE FROM NARADA FALLS. ILLUSTRATES APPEARANCE OF FOREST IN UPPER CANADIAN ZONE. TREES WITH SCALY BARK ARE ALASKA YELLOW-CEDAR (*Chamaecyparis nootkatensis*). MOST OF THE OTHER TREES VISIBLE IN PICTURE ARE PACIFIC SILVER FIR (*Abies amabilis*).



Figure 6.—MOUNT RAINIER FROM MAZAMA RIDGE NEAR FARAWAY ROCK. ARTIST'S POOL IN FOREGROUND. ILLUSTRATES CHARACTER OF FOREST AND MEADOW AREAS IN HUDSONIAN ZONE. THE SPIRE-LIKE TREES ARE ALPINE FIR (*Abies lasiocarpa*).

Figure 7.—WILLIS WALL AND THE GREAT CIRQUE OF THE CARBON GLACIER FROM THE MYSTIC LAKE-MORaine PARK DIVIDE ON THE WONDERLAND TRAIL. ILLUSTRATES CHARACTER OF BARREN, ROCKY GLACIER AND SNOW-COVERED ARCTIC-ALPINE ZONE.







Figure 9.—FIELD OF AVALANCHE FAWN LILIES IN PARADISE VALLEY. *Lindsley photo.*

Figure 10.—MOUNT RAINIER
FROM TOLMIE PEAK FIRE
LOOKOUT. LAKE EUNICE IN
FOREGROUND.



Figure 8.—MOUNT RAINIER
IN WINTER FROM MARMOT
POINT.





Figure 11.—MOUNT RAINIER AND EMMONS GLACIER FROM “EMMONS VISTA” IN YAKIMA PARK (SUNRISE).

Figure 12.—LICORICEFERN (*Polypodium vulgare* var. *columbianum*).



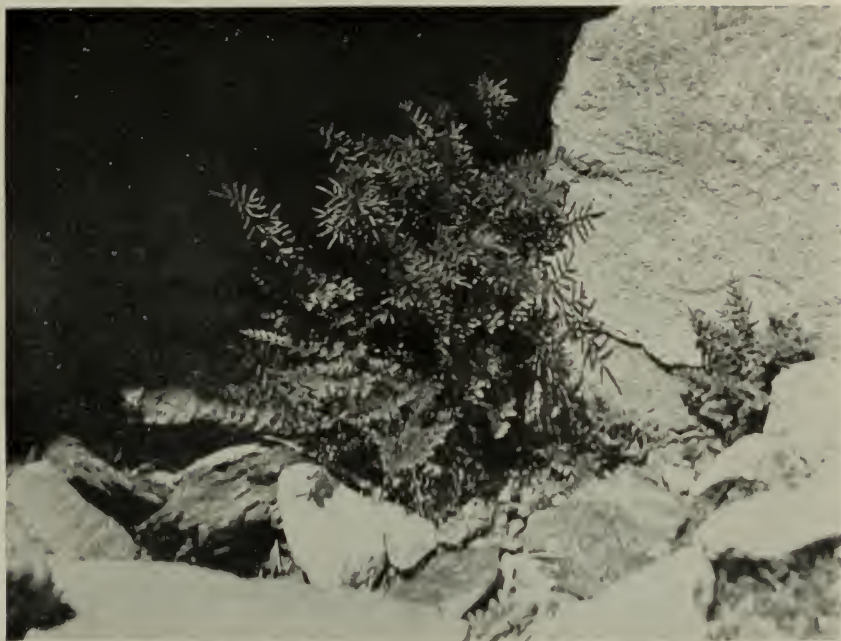


Figure 13.—AMERICAN ROCKBRAKE (*Cryptogramma acrostichoides*).

Figure 14.—AMERICAN MAIDENHAIR (*Adiantum pedatum* var. *aleuticum*).





Figure 15.—LACE LIP-
FERN (*Cheilanthes*
gracillima).



Figure 16.—DEER FERN
(*Struthiopteris*
spicant).

two issues of *The Mazama*, was the first published work on the botany of this region.⁴ Other early botanists who collected in Mount Rainier National Park were Rev. E. C. Smith (1889, 1890), Dr. E. L. Green (1889), M. W. Gorman (1897), and J. B. Flett (1895, 1896).

Flett, in addition to being one of the early botanists of this area, was also one of the best known of the more recent botanical collectors. From 1913 to 1921, while employed as a park ranger, he made extensive collections in the park, and his activity in this line resulted in the publication of the original Government pamphlet concerning the flora of Mount Rainier National Park.⁵ Fred Warren, while employed as a seasonal park ranger, made botanical collections from 1926-33, and, with Dr. Harold St. John, published a list of plants for this area in the *American Midland Naturalist*.⁶ Dr. G. N. Jones has also collected in this area. He is the author of a technical guide to the vascular plants of the park published by the University of Washington Press in 1938.⁷ Winona Bailey, J. W. Thompson, Harold W. Smith, Dr. T. C. Frye, and Dr. George B. Rigg are a few of the many other botanists who have included the park in their explorations. In 1934 and 1935 collections were made by H. E. Bailey in connection with the preparation of a forest type map of the park by the Division of Forestry of the National Park Service.

The naturalist department of Mount Rainier National Park, in connection with an integrated program of field research designed eventually to encompass all phases of natural history of the park, undertook systematic botanical collections throughout the park in 1929 with a view toward the development of an adequate park herbarium for use in the interpretive program. This work resulted in the publication of a mimeographed issue of *Mount Rainier National Park Nature Notes* in 1938⁸ upon which this book is based.

PURPOSE AND SCOPE OF THIS PUBLICATION

Inasmuch as the flora of Mount Rainier National Park constitutes one of the park's principal features of interest, there naturally exists a widespread public demand for an up-to-date, authentic, adequately illustrated, and moderately priced book on this subject suitable for use by the layman. For quite a few years J. B. Flett's pamphlet, issued by the National Park

⁴ *The Mazama*. Vol. 2, No. 2, April 1901; vol. 2, No. 4, December 1904.

⁵ Flett, J. B. Features of the Flora of Mount Rainier National Park. National Park Service, 1922.

⁶ St. John, Harold and Warren, Fred A. The Plants of Mount Rainier National Park. *American Midland Naturalist*, November 1937.

⁷ Jones, G. N. Ferns and Flowering Plants of Mount Rainier National Park. University of Washington Press, 1938.

⁸ Brockman, C. Frank. Flora of Mount Rainier National Park. *Mount Rainier National Park Nature Notes*, March-June 1938.

Service in 1922, fulfilled that need. Quite obviously, however, botanical research in the park during the past two decades has greatly increased our knowledge of the flora, a subject in which many park visitors are interested. It is with this in mind that this publication, based upon the issue of *Nature Notes* published in 1938, has been prepared. An effort has been made, insofar as possible, to avoid technical language and to substitute therefor descriptive characters that can be readily observed and used in the field by the average visitor.

The ferns and flowering plants, including the trees, have been described. Greatest emphasis, of course, has been given to those plants which will be most generally observed.

NOMENCLATURE

In accordance with the policy of the National Park Service, scientific names of plants in this publication follow the second edition (1942) of *Standardized Plant Names*.⁹ Common names of herbaceous plants follow the same authority, while common names of trees and other woody plants follow Sudworth's *Check List of the Forest Trees of the United States; Their Names and Ranges* as revised by supplement of January 23, 1940, with the *Standardized Plant Names* revised name in parenthesis if it differs. In some instances, however, where certain common names have been accepted locally by long and continued usage these have also been included to avoid confusion.

ACKNOWLEDGMENTS

Many persons have been of material assistance in the preparation of this publication, and grateful acknowledgment is made of their help and cooperation.

Particular mention should be made of the contributions of the seasonal naturalist staff, especially those of Charles Landes who, as ranger-naturalist in Mount Rainier National Park for many years, beginning in 1920, had a major part in the development of the park herbarium. In addition, Harold W. Smith gave freely of his time in field collecting, in work on the herbarium, and in offering advice relative to the preparation of the manuscript. Messrs. Fred Warren, H. E. Bailey, J. W. Thompson, and J. B. Flett also have contributed specimens to the park herbarium. The Bureau of Plant Industry, Washington, D. C., as well as Miss Alice Eastwood of the California Academy of Sciences, cooperated in checking the identification of certain species. Drs. T. C. Frye, George B. Rigg, and Leo C. Hitchcock of the Department of Botany, University of Washington, offered many helpful suggestions.

⁹ Prepared for the American Joint Committee on Horticultural Nomenclature by its Editorial Committee—Harlan P. Kelsey and William A. Dayton.

Field Key to the Flora of Mount Rainier National Park

THIS FIELD KEY, provided for those who may desire to identify plants, is carried to family or genus (species in some cases). Identification is secured by a series of eliminations which eventually narrows to one plant group.

One merely compares the unknown plant with both descriptions found after the letter "a" (left hand side of page), and selects the one most typical of the specimen in question. The number or letter to the right refers the reader to a second pair of possibilities (again found on the left) which are examined in turn and from which the most typical description is again selected. This process is repeated, each unlikely possibility in each pair of descriptions being eliminated, until the search is narrowed to the family or genus to which the plant belongs. With this as a known quantity, one merely refers to the page on which detailed descriptions of all species in that group are given to obtain specific identification.

So that those plants which do not bear seeds or true flowers (ferns and fern allies) may be definitely set apart from the true flowering plants, the former are identified by letter in the key, while the latter are identified by number.



- a. Seed-producing plants (all trees, shrubs, and herbaceous plants commonly regarded as "flowers") 1
- a. Plants spore-bearing; without seeds or true flowers b

FERNS AND FERN ALLIES (PTERIDOPHYTES)

- b. Plants fern-like c
- b. Plants not fern-like d
- c. Plants distinctly fern-like with simple or compound fronds; spores borne in small, brownish sporangia on back or margins of fronds *Fern family* (p. 33)

- c. Plants not distinctly fern-like; spores borne in large sporangia arranged in a grape-like cluster. Spore-bearing part bladeless and not frond-like, appearing to arise from leafstalk of foliate portion of plant *Adderstongue family* (p. 33)
- d. Plants having round, ridged, hollow, conspicuously jointed stems which are "sandy" or minutely roughened to the touch; joints covered with toothed sheaths; leaves united into sheath-like whorls about stem at joints. Spores borne in sporangia on scales of a terminal, dry, cone-like spike . *Horsetail family* (p. 44)
- d. Stems not conspicuously jointed and otherwise not as described above e
- e. Stems elongate, creeping (sometimes underground). Leaves small, short, moss-like or scale-like and closely overlapping . . f
- e. Leaves long and linear, grass-like or awl-shaped and overlapping at their base. Stem short and onion-like. Found in boggy soils or partly submerged at edges of ponds or lakes
Quillwort family (p. 45)
- f. Spores of 1 kind. Fairly common *Clubmoss family* (p. 45)
- f. Spores of 2 kinds. Uncommon *Selaginella family* (p. 45)

FLOWERING PLANTS (SPERMATOPHYTES)

- 1. Woody plants; shrubs or trees 2
- 1. Herbaceous plants 29
- 2. Foliage needle-like or scale-like 3
- 2. Foliage not needle-like or scale-like 8
- 3. Plant parasitic on evergreen trees; very small (three-quarters of an inch to 4 inches tall), yellowish *Mistletoe family* (p. 72)
- 3. Not parasitic; evergreen plants—trees or shrubs. 4
- 4. Fruit a woody cone or firm bluish berry *Pine family* (p. 46)
- 4. Not cone bearing 5
- 5. Trees; fruit a small green, hard nutlet partially surrounded by a bright red gelatinous aril *Yew family* (p. 45)
- 5. Shrubs; low growing plants not more than 3 feet tall 6
- 6. Leaves serrate with small teeth, quarter of an inch to 1 inch long, thick leathery, opposite; flowers yellowish to purplish, sessile in leaf axils *Myrtle pachistima* in *Staff Tree family* (p. 117)
- 6. Leaves entire 7
- 7. Fruit a small black berry; flowers small and inconspicuous, scattered and solitary in leaf axils with 3 petal-like sepals, corolla none *Crowberry family* (p. 118)

7. Fruit a capsule; flowers white, yellow, or red, not inconspicuous;
petals united into bell-like or urn-like form
Phyllodoce, *Harrimanella*, and *Cassiope* in *Heath family* (p. 123)
8. Plants evergreen 9
8. Plants not evergreen; deciduous 10
9. Foliage spiny and holly-like; flowers yellow, in racemes; corolla
not urn-shaped; fruit a dark blue berry
Mahonia in *Barberry family* (p. 91)
9. Foliage not as above; flowers not yellow but generally white to
rose; corolla urn-shaped; margins of leaves entire or serrate
Vaccinium ovatum, *Gaultheria*, *Arctostaphylos*, *Kalmia*, and
Arbutus in *Heath family* (p. 123)
10. Leaves opposite 11
10. Leaves alternate. 14
11. Leaves toothed, lobed, or compound 12
11. Leaves entire 13
12. Leaves distinctly 3 to 9 palmately lobed; fruit dry and winged;
petals of flowers distinct *Maple family* (p. 118)
12. Leaves not as above; fruit fleshy and not winged; petals of flowers
united. *Honeysuckle family* (p. 147)
13. Leaves acute, apparently whorled; "flowers" white, in terminal flat-
topped clusters *Dogwood family* (p. 122)
13. Leaves obtuse, not whorled; flowers pink and clustered in the leaf
axils *Spreading snowberry* in *Honeysuckle family* (p. 148)
14. Stems with spines or prickles 15
14. Stems without spines or prickles 17
15. Leaves compound, composed of 3 or more leaflets
Rose family (p. 101)
15. Leaves simple, toothed or lobed 16
16. Leaves very large and maple-like, covered with spines on the
under side. *Devilscub* (p. 120)
16. Leaves small to medium, spines not present on leaves; flowers
in racemes *Currants and Gooseberries* (p. 100)
17. Leaves compound with 5 or more leaflets 18
17. Leaves simple, entire or toothed 19
18. Flowers white; fruit juicy and red; leaflets 1 to 2 inches long;
a tall shrub 4 to 9 feet high *Mountainash* (p. 106)
18. Flowers yellow; fruit dry; leaflets three-quarters of an inch or
less long; low-growing, not more than 12 inches tall
Bush cinquefoil (p. 106)

19. Leaves entire, flowers in catkins, leaves usually with stipule;
tall shrubs or small trees; buds single-scaled . . . *Willow* (p. 69)
19. Leaves from finely toothed to lobed 20
20. Flowers in catkins, greenish to brownish, corolla lacking; fruit
cone-like, nut-like, or a capsule 21
20. Flowers never in catkins, not green, corolla present; fruit never
cone-like 23
21. Fruit cone-like or nut-like 22
21. Fruit a small capsule; each seed with a tuft of hair
Willow family (p. 69)
22. Leaves coarsely lobed; fruit an acorn. A very uncommon tree
Oregon white oak (p. 72)
22. Leaves not lobed, coarsely and doubly toothed; fruit cone-like.
Very common in moist ground *Alder* (p. 71)
23. Leaves conspicuously lobed or about as long as broad. 24
23. Leaves toothed but never lobed 25
24. Fruit like a raspberry; petals quarter of an inch to half an inch
long *Rubus* in *Rose family* (p. 103)
24. Fruit like a currant; petals less than quarter of an inch long . .
Currants and Gooseberries (p. 100)
25. Petals united so that corolla is urn-shaped; fruit juicy with
minute seeds *Vaccinium* in *Heath family* (p. 127)
25. Petals distinct 26
26. Fruit juicy with a single large seed. . . *Prunus* in *Rose family* (p. 104)
26. Fruit dry or, if juicy, containing 2 or more seeds 27
27. Flowers in racemes; fruit juicy *Pacific serviceberry* (p. 104)
27. Flowers not in racemes; fruit either dry or juicy 29
28. Stamens 4 or 5; flowers green or white . . *Buckthorn family* (p. 118)
28. Stamens 15 or more; flowers pink or white . . *Rose family* (p. 101)
29. Grasses or grass-like plants 30
29. Plants not as above 32
30. Flowers enclosed by husk-like scales, without a proper calyx or
corolla; fruit 1-seeded and not opening 31
30. Flowers not enclosed by husk-like scales, composed of 3 petals
and 3 sepals; fruit a capsule containing 3 or more seeds
Rush family (p. 54)
31. Leaves 2-ranked on the stem; stems round or somewhat flattened,
usually hollow, leaf sheaths usually split; flowers with 2 bracts—
1 above and 1 below *Grass family* (p. 50)

31. Leaves 3-ranked on the stem; stems usually 3-angled, sometimes round; leaf sheaths not split; flowers with only 1 bract and this below *Sedge family* (p. 52)
32. Plants leafless, parasitic; no green coloring matter present, instead plant brownish or yellowish. *Ghostpipe* (p. 138)
32. Foliage present (though sometimes leaves reduced to scales); either saprophytic or not 33
33. Leaves composed of 3 or more leaflets or lobed to the midrib 34
33. Leaves simple, entire or toothed if not lobed to the midrib. 50
34. Plants floating on, or submerged in, water; leaves alternate and flowers white *Watercrowfoot buttercup* (p. 82)
34. Plants not growing in water 35
35. Flowers sessile, in dense heads surrounded by bracts and often resembling a single flower *Sunflower family* (p. 148)
35. Flowers not in dense heads surrounded by bracts 36
36. Leaves opposite or else all arising from the base of the flower stem 37
36. Leaves alternate; stems leafy 42
37. Flower-bearing stems naked. 38
37. Flower-bearing stems leafy 41
38. Leaves tri-ternately compound; leaflets thin and somewhat heart-shaped at base, three-quarters of an inch to 2 inches long, angularly 3-lobed or margin repand or sub-entire; scape naked or bearing a single leaf; flowers white, in raceme or panicles; fruit a follicle *Barrenwort* (p. 82)
38. Leaves not tri-ternately compound 39
39. Outer margin of leaflets coarsely sinuate-dentate; flowers small, white, and in an erect spike; fruit dry and 1-seeded
Deerfoot vanillaleaf (p. 82)
39. Margin of leaflets entire 40
40. Petals united but deeply 5-parted; flowers in racemes 10- to 20-flowered; peduncles stout; plant of marshy situations
Bogbean (p. 130)
40. Petals distinct; flowers solitary on slender short peduncles; plant of the deep woods. *Oregon oxalis* (p. 117)
41. Plants generally hairy; corolla of distinct petals
Small geranium (p. 117)
41. Plants glabrous or nearly so; corolla of united petals, tubular or funnel-form *Valerian family* (p. 147)

42. Petals united 43
42. Petals distinct or sometimes wanting 44
43. Capsule 3-celled; flowers not in 1-sided racemes
Phlox family (p. 130)
43. Capsule 1-celled; flowers mostly in 1-sided racemes, these often
clustered *Waterleaf family* (p. 131)
44. Flower pea-like; fruit a legume *Pea family* (p. 115)
44. Flower and fruit not as above 45
45. Flowers in umbels *Parsley family* (p. 120)
45. Flowers not in umbels 46
46. Four petals; flowers in racemes; fruit a pod and this splitting into
2 parts 47
46. Five or more petals or sometimes petals wanting; flowers not in
racemes 48
47. Petals unlike, 1-spurred; leaves finely divided into numerous
narrow lobes. *Fumitory family* (p. 91)
47. Petals all alike, small, not spurred; leaflets toothed or lobed
Mustard family (p. 91)
48. Stamens 5 or 10; flowers white or pink. . . *Saxifrage family* (p. 95)
48. Stamens 15 or more; flowers varied in color 49
49. Leaves without stipules; sepals distinct and petals often absent
Buttercup family (p. 79)
49. Leaves with stipules; sepals more or less united, petals always
present *Rose family* (p. 101)
50. Plants floating on, or submerged in, water; attached to bottom
of lakes or streams 51
50. Plants not floating on, or submerged in, water 55
51. Leaves in whorls of 6 to 12 *Marestail* (p. 120)
51. Leaves not whorled, alternate or opposite 52
52. Leaves heart-shaped at base, 6 to 8 inches wide or wider, flowers
yellow and 2 to 4 inches across *Waterlily family* (p. 79)
52. Leaves not heart-shaped; much less than 6 inches wide; flowers
small and green 53
53. Flowers in globose heads *Burreed family* (p. 50)
53. Flowers not in globose heads 54
54. Leaves quarter of an inch to three-quarters of an inch long;
flowers sessile in leaf axils; leaves opposite; fruit not beaked
Waterstarwort family (p. 117)

54. Leaves usually much more than three-quarters of an inch long; flowers in spikes or sometimes sessile in the leaf axils but then the fruit is beaked *Pondweed family* (p. 50)
55. Leaves opposite or whorled (sometimes a few of the upper leaves alternate); stems leafy 56
55. Leaves alternate or else all borne at base of stem; stems often naked (1 or 2 pair of lowest leaves rarely opposite) 79
56. Leaves toothed or lobed 57
56. Leaves entire 64
57. Stems with slender stinging hairs; flowers green and in cymes
Lyall nettle (p. 72)
57. Stems without stinging hairs; flowers colored or, if green, not in cymes 58
58. Flowers in dense heads surrounded by an involucre of bracts
Sunflower family (p. 148)
58. Flowers not in dense heads as in above case 59
59. Petals distinct or absent altogether 60
59. Petals united 62
60. Leaves not evergreen, thin; petals 2 to 4
Evening primrose family (p. 119)
60. Leaves evergreen, leathery; petals 5. 61
61. Leaves scattered along stem, oblanceolate in outline; flowers in corymbs *Pipsissewa* (p. 125)
61. Leaves basal and broadly ovate; flowers in racemes . *Pyrola* (p. 125)
62. Foliage evergreen; stems creeping; flowers 2, pendant at the end of a slender stalk *Twinflower* (p. 148)
62. Leaves not evergreen; stems erect; flowers not in pairs as in above case 63
63. Fruit a capsule; corolla 2-lipped; stems not squared
Figwort family (p. 133)
63. Fruit of 4 nutlets in bottom of calyx; corolla 2-lipped or regular; stems square *Mint family* (p. 132)
64. Leaves in whorls of 3 or more, or else a single pair on the stem 65
64. Leaves opposite and several pairs on each stem. 70
65. Leaves 2 on each stem 66
65. Leaves 3 or more on each stem 67
66. Petals 3, very unlike and green; leaves oval, rounded, or kidney-shaped. *Listera* (p. 68)
66. Petals 5, all alike, white or pink; leaves lanceolate
Springbeauty (p. 75)

67. Flowers sessile in leaf axils *Marestail* (p. 120)
67. Flowers not sessile in leaf axils 68
68. Stems bearing numerous whorls of leaves . . *Madder family* (p. 147)
68. Stems bearing a single whorl of leaves 69
69. Flowers in dense head surrounded by 4 white, petal-like bracts;
leaves 4 to 6 *Dogwood* (p. 122)
69. Flowers 1 per stem with 3 petals; leaves 3 . . . *Trillium* (p. 58)
70. Plants parasitic on branches of evergreen trees
Mistletoe family (p. 72)
70. Plants not as above; growing on ground 71
71. Corolla lacking or of distinct petals. 72
71. Corolla of united petals. 75
72. Leaves very thick and fleshy *Stonecrop family* (p. 95)
72. Leaves thin 73
73. Petals yellow; leaves with black dots . . *St. Johnswort family* (p. 119)
73. Petals not always yellow; leaves not black-dotted. 74
74. Calyx and usually a corolla present; calyx borne on top of ovary
and fruit; petals 2 to 4 *Evening primrose family* (p. 119)
74. Calyx borne at base of ovary and enclosing capsule; petals
usually 5 *Pink family* (p. 76)
75. Fruit of 2 long pods; juice milky *Dogbane family* (p. 130)
75. Fruit not as above; juice not milky. 76
76. Corolla 2-lipped. 77
76. Corolla not 2-lipped; lobes all alike. 78
77. Fruit of 4 nutlets in bottom of calyx; corolla purple. *Selfheal* (p. 133)
77. Fruit a capsule; corolla variously shaped . . *Figwort family* (p. 133)
78. Capsule 1-celled; corolla half an inch to 1½ inches long and deep
blue *Gentian* (p. 130)
78. Capsule 3-celled; corolla an eighth of an inch to three-quarters
of an inch long, white and light blue or purple . *Phlox family* (p. 130)
79. Leaves evidently parallel-veined; petals and sepals (when pres-
ent) 3 each 80
79. Leaves not veined; sepals (always present) and petals (often ab-
sent) usually 4 to 5 each (some plants occasionally appear to be
parallel-veined but such never have 3 sepals) 86
80. Flowers sessile in dense globose heads . . . *Burreed family* (p. 50)
80. Flowers not sessile in dense globose heads 81

81. Flowers sessile in dense cylindrical heads; lower part of spike brown and velvety; plants 2 to 4 feet tall with spongy linear leaves; plant of marshy situations *Cattail* (p. 50)
81. Flowers not as above; habitat of plants various. 83
82. Flowers sessile in spike, this surrounded by a yellow hood-like spathe; leaves basal; plant of marshy situations
American yellowskunkcabbage (p. 53)
82. Flowers never as above; leaves various 83
83. Fruit numerous small akenes in a head; petals white; leaves arrow-shaped *Wappato* (not yet found in park)
83. Fruit not as above; petals variously colored; leaves never arrow-shaped 84
84. Petals unlike, 1 very different from the other 2 *Orchid family* (p. 67)
84. Petals all alike. 85
85. Petals (blue) and sepals at top of the ovary; stamens 3; fruit dry. *Iris family* (p. 58)
85. Petals and sepals at base of ovary; stamens 6; fruit dry or juicy. *Lily family* (p. 54)
86. Plants without green coloring matter; saprophytic; leaves all scale-like 87
86. Plants with green leaves 90
87. Plant glabrous. 88
87. Plant hairy; 1 to 5 feet tall; stem straight and simple; flowers in a raceme; purple to brown in color; petals united and urn-shaped *Woodland pinedrops* (p. 125)
88. Petals none; plant reddish; flowers in a spike; stem stout and erect, 10 to 15 inches tall, quarter of an inch to half an inch in diameter. *Barber-pole* (p. 124)
88. Petals present 89
89. Petals united except at tips; plant stout and fleshy, white or brownish; flowers in short, crowded raceme; leaves imbricated
Cone plant (p. 125)
89. Petals free almost to base of corolla; white or tawny-red; flowers one to several per stem *Indianpipe* (p. 124)
90. Stems naked; leaves all basal upon flowering stem 91
90. Stems leafy; usually with 2 or more leaves. 105
91. Flowers in dense head on a common receptacle surrounded by 1 or more rows of bracts; heads 1 to many; fruit an akene, usually with tuft of bristles at the top. *Sunflower family* (p. 148)

91. Flowers not in dense head upon a common receptacle surrounded by bracts (if they appear to be so the perianth is composed of distinct petals); fruit never an akene with tuft of bristles 92
92. Leaves with long, gland-tipped sticky hairs; flowers in racemes

Sundew (p. 94)
92. Leaves without long, gland-tipped hairs; flowers various. . . . 93
93. Flowers in dense cylindric spikes; leaves with 3 or more ribs

Plantain family (p. 138)
93. Flowers not in spikes; leaves not ribbed 94
94. Corolla none; calyx 3-lobed, bell-shaped or hemispheric; leaves large and reniform-cordate *Wildginger* (p. 72)
94. Corolla present, or if flower without petals, then with colored sepals 95
95. Petals united 96
95. Petals distinct, or if no corolla present, then with distinct sepals . 98
96. Flowers 1 per stem; corolla spurred, purple; leaves sessile

Butterwort (p. 138)
96. Flowers more than 1 on a stem 97
97. Flowers in umbels; leaves longer than broad

Primrose family (p. 129)
97. Flowers not in umbels; leaves as long as broad . *Mistmaiden* (p. 132)
98. Petals none; flowers with 6 sepals; flowers in clusters surrounded by an involucre of united bracts. *Eriogonum* (p. 73)
98. Petals present; sepals 4, 5, 8, or 10; flowers not in a cluster surrounded by an involucre 99
99. Petals and sepals 8 to 10 each; leaves white-woolly beneath

Dryad (p. 103)
99. Petals and sepals 4 to 5 each; leaves not white-woolly beneath . 100
100. Petals and sepals 4 each, inserted at top of ovary and fruit

Evening primrose family (p. 119)
100. Petals and sepals 5 each, not inserted at top of ovary and fruit . 101
101. Petals yellow; fruit of numerous akenes . . *Buttercup family* (p. 79)
101. Fruit a capsule; petals variously colored. 102
102. Petals yellow or violet and 1-spurred at base . *Violet family* (p. 119)
102. Petals white green or pink, none spurred 103
103. Leaves thick and evergreen 104
103. Leaves thin and not evergreen . . *Rockymountain parnassia* (p. 96)
104. Flowers in corymbis; stems leafy *Pipsissewa* (p. 125)
104. Flowers in racemes; leaves basal *Pyrola* (p. 125)

105. Flowers in dense heads on a common receptacle surrounded by 1 or more rows of bracts; heads 1 to many; fruit an akene, usually with tuft of hairs at top *Sunflower family* (p. 148)
105. Flowers not as above; fruit not an akene 106
106. Petals of corolla united 107
106. Petals distinct or often wanting; calyx often corolla-like 112
107. Stems more or less creeping; fruit fleshy; leaves leathery and evergreen; flowers pink to white *Gaultheria* (p. 128)
107. Stem erect, rarely prostrate or trailing; fruit dry 108
108. Fruit of 4 nutlets; leaves entire; corolla regular
Borage family (p. 132)
108. Fruit a capsule; leaves entire, toothed, or lobed; corolla regular and 2-lipped 109
109. Corolla 2-lipped or saucer-shaped *Figwort family* (p. 133)
109. Corolla not as above 110
110. Stamens protruding from corolla; leaves entire or lobed. . . .
Phacelia (p. 132)
110. Stamens shorter than corolla; leaves entire or toothed 111
111. Leaves entire; corolla tubular and about quarter of an inch long, pink or pale purple, not drooping *Microsteris* (p. 131)
111. Leaves finely toothed; corolla bell-shaped and about half an inch to three-quarters of an inch long, blue, and drooping
Bellflower family (p. 147)
112. Petals none; calyx sometimes corolla-like; leaves entire, toothed or lobed 113
112. Petals present 116
113. Fruit a utricle; endosperm mealy; a white, mealy, glandular, pubescent herb; flowers very small, green, sessile, and in axillary or terminal (often paniced or compound) spikes
Lambsquarters goosefoot (p. 75)
113. Fruit not a utricle 114
114. Fruit a head of numerous hairy akenes; sepals petal-like.
Anemone (p. 80)
114. Fruit a capsule or a single akene; sepals various 115
115. Fruit containing 2 or more seeds; leaves toothed or lobed; flowers in racemes *Pepperweed* (p. 93)
115. Fruit 1-seeded; leaves entire, toothed or lobed, with sheathing stipules; fruit often 3-angled *Buckwheat family* (p. 73)
116. Petals unlike, 1 with a spur at base *Violet family* (p. 119)
116. Petals all alike or nearly so; none spurred 117

117. Sepals 2; leaves fleshy *Purslane family* (p. 75)
117. Sepals 4 or more, or none 118
118. Leaves fleshy *Stonecrop family* (p. 95)
118. Leaves thin, often hairy 119
119. Flowers with 4 petals and 4 sepals 120
119. Sepals and petals each 5 or more. 121
120. Sepals at top of ovary and fruit . . *Evening primrose family* (p. 119)
120. Sepals at base of ovary and fruit *Mustard family* (p. 91)
121. Flowers in umbels *Parsley family* (p. 120)
121. Flowers not in umbels 122
122. Sepals distinct. 123
122. Sepals united at base. 124
123. Fruit of numerous akenes or of several pods . *Buttercup family* (p. 79)
123. Fruit a berry; flowers in lateral peduncled small cymes
Nightshade (p. 133)
124. Fruit composed of numerous sections (as in an orange) covered
 with long, stiff hairs; stamens united into a column
Mallow family (p. 119)
124. Fruit of 2 to 4 distinct or united pods; not long-hairy; stamens
 distinct *Saxifrage family* (p. 95)

Detailed Descriptions of Native Plants of Mount Rainier National Park

ADDERSTONGUE FAMILY (OPHIOGLOSSACEAE)

THIS FAMILY IS REPRESENTED in the park by three species of plants which are generally known as grapefern. All are characterized by a grape-like bunch of sporangia borne upon a leafless branch that arises from a point on the stalk of the fern-like, 1-to-3-compound, foliate leaf. They are small plants which prefer moist locations in the woods. They will be rarely noticed by the average visitor. The three species are *Botrychium pinnatum* St. John, *B. lanceolatum* (S. G. Gmel.) Angstr., and *B. silaifolium* Presl.

FERN FAMILY (POLYPODIACEAE)

Because of their beauty and abundance, the ferns of the park occupy an important place in its botany.

Ferns reproduce by means of spores which are borne in spore cases (sporangia) clustered in small groups (sori) upon the under side or margins of the fronds.

Common polypody or licoricefern (*Polypodium vulgare* L.). Common in the park. Although found up to 5,000 feet, it will be most generally noted below 3,500 feet, where it usually inhabits moist, mossy locations on cliffs, tree trunks, etc. Fronds are from 6 to 18 inches long and from 1 to 3 inches wide, with from 10 to 35 pair of pinnae which are margined with small teeth, are sessile, lanceolate in outline, and pointed. Spores are borne in conspicuous, round clusters upon the under side of the pinnae. The rhizome (rootstock) has a distinct licorice taste—hence the common name.

A variety of the foregoing—*P. vulgare* L. var. *columbianum* Gilb.—may also be found. It differs from the above in that it has smaller fronds and fewer pinnae—the latter being rounded rather than pointed at the tip, and with entire or wavy (crenate) margins.

Western bracken (*Pteridium aquilinum* (L.) Kuhn, var. *pubescens* Underw.). A very common weed fern that is widely distributed throughout the park. While it grows under a wide variety of conditions, its character-

istic habitat here is open areas in the forest, such as old burns and along highways where the soil is generally rather dry and of poor quality. Fronds vary from 12 inches to 6 feet in length (average being about 3 feet) and are equilateral in outline, sharply pointed, or tapering. They are generally 3-compound, stiff, rather brittle and harsh to the touch, grey-green in color, and grey-woolly on the under side. The spores are borne along the margins of the pinnules which are recurved throughout the entire length.

American rockbrake (*Cryptogramma acrostichoides* R. Br.). Common in dry, rocky locations between 2,500 and 5,500 feet. It is 6 to 12 inches tall, with densely bunched foliage that resembles parsley in general appearance. Fronds are of two kinds—spore-bearing and vegetative. The latter have long, straw-colored stalks, are 2- to 3-compound with the pinnules obovate in outline and having crenate margins. Spore-bearing fronds are longer than the vegetative and have linear pinnules whose margins are recurved throughout their entire length, beneath which the spores are borne.

American maidenhair (*Adiantum pedatum* L. var. *aleuticum* Rupr.). Fairly common up to 3,500 feet. This is a plant of delicate beauty with fronds 10 to 40 inches long, 3-compound, and generally oval or kidney-shaped in outline, growing in an open, loosely spreading tuft. The thin pinnules are joined to the stem by a short, slender petiole and are characterized by several deep clefts upon the upper margin. Spores are borne beneath crescent-shaped, recurved portions of the margin. The leafstalk is shiny, as if varnished, and either dark brown or black.

Lace lipfern (*Cheilanthes gracillima* D. C. Eaton). A small, inconspicuous, and rather uncommon fern that will be encountered only by those who venture about the more inaccessible, rocky locations of the park in the upper Hudsonian or lower Arctic-Alpine Zones. Fronds are from 4 to 12 inches long and densely clustered in a compact tuft. Individual fronds are linear in outline, 2-compound (sometimes 3-compound), deep green above, brownish and densely fuzzy on the under side. The pinnules, under whose recurved margins the spores are borne, are crowded and impart a lacy appearance to the plant.

Deerfern (*Struthiopteris spicant* (L.) Wies.). One of the most common and familiar ferns of the heavily wooded Humid Transition and lower Canadian Zones in the park, preferring a moist, shaded habitat in springy, well-drained soils. Fronds are of two kinds—vegetative and spore-bearing. The former are evergreen and are arranged in a tufted rosette upon the ground, are from 6 to 36 inches long and 1 to 3 inches wide, 1-compound, of leathery texture, and linear to linear-lanceolate in general outline, being widest at the middle and tapering toward both ends. The pinnules are closely crowded, sessile, and short. Spore-bearing fronds, which unfold in spring and early summer, are erect and from 16 to 20 inches tall, with narrow, linear pinnae spaced far apart upon the stem.



Figure 17.—LADYFERN (*Athyrium filixfemina*).

Figure 18.—WESTERN SWORDFERN (*Polystichum munitum*). Victor Scheffer Photo.

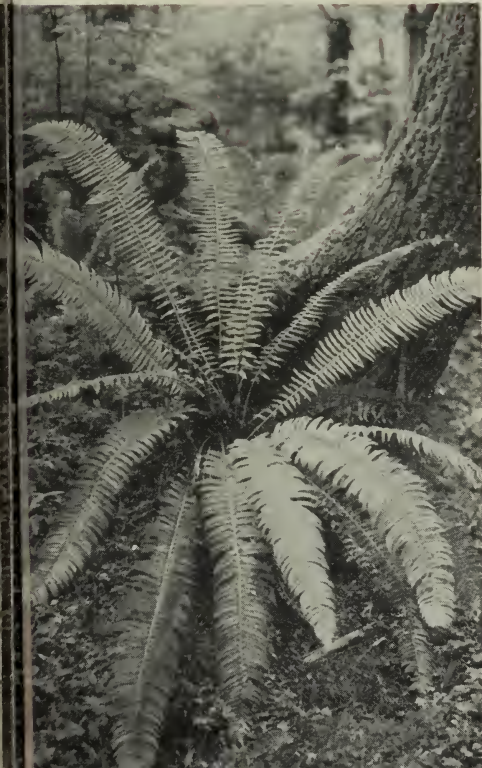


Figure 19.—FOLIAGE OF PACIFIC YEW (*Taxus brevifolia*). NOTE FLAT NEEDLES WITH SHORT POINT AT APEX. BACKGROUND RULED IN INCH SQUARES.





Figure 20.—FOLIAGE AND CONE OF WESTERN WHITE PINE (*Pinus monticola*).



Figure 21.—FOLIAGE AND CONES OF WHITEBARK PINE (*Pinus albicaulis*). BACKGROUND RULED IN INCH SQUARES.

Figure 22.—FOLIAGE AND CONES OF LODGEPOLE PINE (*Pinus contorta*). BACKGROUND RULED IN INCH SQUARES.



Figure 23.—FOLIAGE AND CONE OF PONDEROSA PINE (*Pinus ponderosa*). BACKGROUND RULED IN INCH SQUARES.

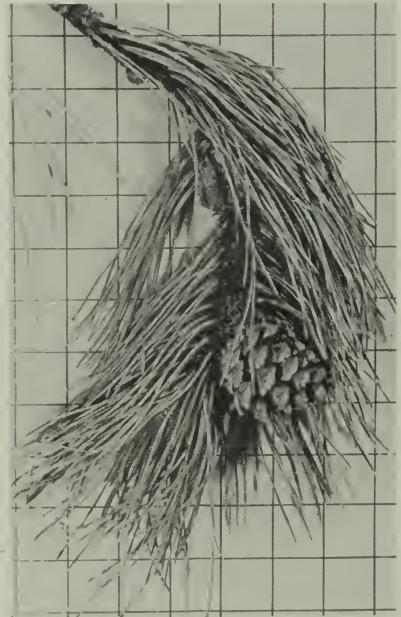




Figure 24.—FOLIAGE AND CONE OF ENGELMANN SPRUCE (*Picea engelmanni*). NOTE FOUR-SIDED, POINTED NEEDLES AND THIN, PAPERY SCALES OF CONE. BACKGROUND RULED IN INCH SQUARES.

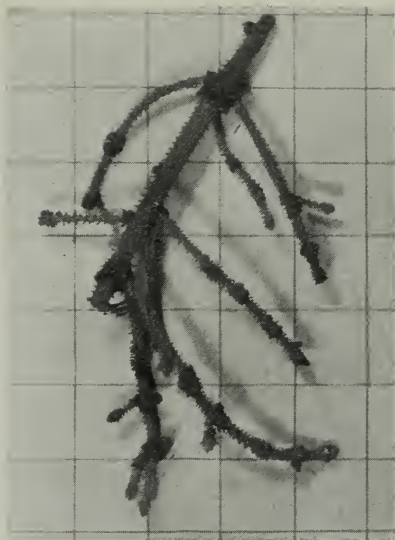


Figure 25.—NAKED BRANCH OF ENGELMANN SPRUCE. ILLUSTRATES SHORT, WOODY BASES UPON WHICH NEEDLES GROW. THE ROUGH APPEARANCE OF THE TWIGGS, DUE TO THE PRESENCE OF THESE WOODY BASES, IS CHARACTERISTIC OF ALL SPRUCES. BACKGROUND RULED IN INCH SQUARES.

Figure 26.—FOLIAGE AND MATURE CONES OF WESTERN HEMLOCK. (*Tsuga heterophylla*). BACKGROUND RULED IN INCH SQUARES.



Figure 27.—FOLIAGE AND CONES OF MOUNTAIN HEMLOCK (*Tsuga mertensiana*). Lindsley Copyright Photo.





Figure 28.—TRUNKS OF DOUGLAS-FIR ALONG HIGHWAY NEAR KAUTZ CREEK. NOTE HEAVILY RIDGED BARK. *Grant Photo.*



Figure 29.—FOLIAGE OF GRAND FIR (*Abies grandis*). NOTE HOW NEEDLES ARE IN COMB-LIKE ARRANGEMENT ON EITHER SIDE OF THE BRANCH. BACKGROUND RULED IN INCH SQUARES.

Figure 31.—FOLIAGE AND CONES OF NOBLE FIR (*Abies procera*). ILLUSTRATES HOW CONES OF ALL TRUE FIRS STAND ERECT UPON BRANCHES. Natt Dodge Photo.

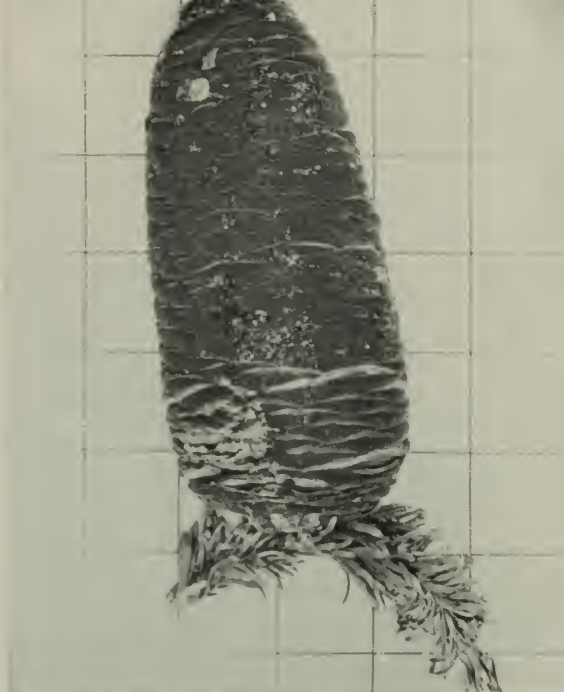


Figure 30.—CONE OF PACIFIC SILVER FIR (*Abies amabilis*). BACKGROUND RULED IN INCH SQUARES.

Figure 32.—CONE SPIKE OF NOBLE FIR, ILLUSTRATING HOW CONES OF ALL TRUE FIRS DISINTEGRATE AT MATURITY, LEAVING CENTRAL SPIKE PERSISTING UPON BRANCHES. BACKGROUND RULED IN INCH SQUARES.





Figure 28.—TRUNKS OF DOUGLAS-FIR ALONG HIGHWAY NEAR KAUTZ CREEK. NOTE HEAVILY RIDGED BARK. *Grant Photo.*



Figure 29.—FOLIAGE OF GRAND FIR (*Abies grandis*). NOTE HOW NEEDLES ARE IN COMB-LIKE ARRANGEMENT ON EITHER SIDE OF THE BRANCH. BACKGROUND RULED IN INCH SQUARES.

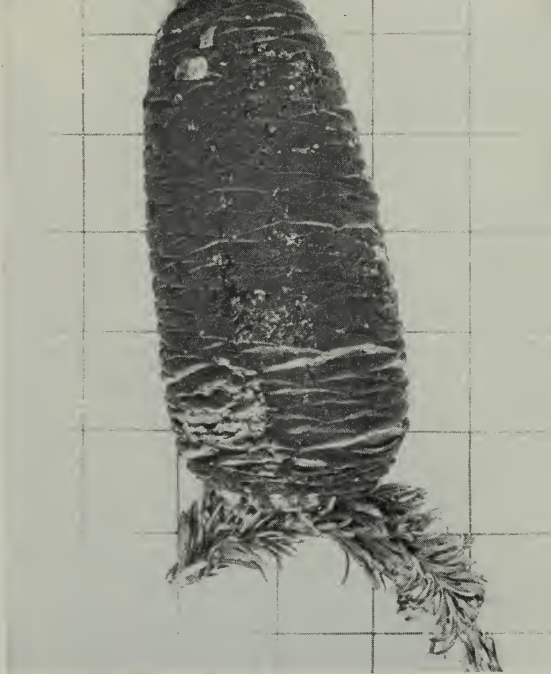


Figure 30.—CONE OF PACIFIC SILVER FIR (*Abies amabilis*). BACKGROUND RULED IN INCH SQUARES.

Figure 31.—FOLIAGE AND CONES OF NOBLE FIR (*Abies procera*). ILLUSTRATES HOW CONES OF ALL TRUE FIRS STAND ERECT UPON BRANCHES. Natt Dodge Photo.



Figure 32.—CONE SPIKE OF NOBLE FIR, ILLUSTRATING HOW CONES OF ALL TRUE FIRS DISINTEGRATE AT MATURITY, LEAVING CENTRAL SPIKE PERSISTING UPON BRANCHES. BACKGROUND RULED IN INCH SQUARES.





Figure 38.—AMERICAN YELLOWSKUNKCABBAGE (*Lysichiton americanum*).

Figure 39.—QUEENCUP BEADLILY (*Clintonia uniflora*).



Green spleenwort (*Asplenium viride* Huds.). A rare fern, generally found in crevices of moist cliffs in the Hudsonian and Arctic-Alpine Zones. Fronds are closely tufted, from 1½ to 6 inches long, and quite narrow. Pinnae are in pairs, there being 5 to 25 pairs on the stem, are very delicate, bright green, and fan-shaped with wavy margins.

Ladyfern (*Athyrium filixfemina* (L.) Roth.). One of the most common of our ferns, this plant will be encountered in moist soils of the deep woods from lower park boundaries up to about 4,000 feet. It is a handsome plant, with long fronds arching gracefully to form a broad open tuft of foliage. Individual fronds are 2- to 3-pinnate, 2 to 6 feet long, and up to 10 inches wide (widest below the middle and tapering toward both ends). Larger pinnae are short-stalked and linear to lanceolate in outline, with sessile pinnules having either slightly wavy or toothed margins.

Alpine ladyfern (*Athyrium alpestre* var. *americanum* Butters). This plant is most common in the Hudsonian Zone of the park where it is often encountered in rock slides or talus slopes. One of its most striking, general characters is the erect, "stiffish" appearance of the densely clustered pinnae. Fronds are 2- to 3-compound, 7 to 36 inches long and 2 to 3 inches wide (widest just below the middle and tapering toward both ends). Stalks of the fronds are short, brown, and covered with straw-colored scales at the base.

Western swordfern (*Polystichum munitum* (Kaulf.) Presl.). Probably the best known fern in the deep woods of the heavily forested Humid Transition and Canadian Zones in the park. The fronds are tufted, evergreen, of a tough leathery texture, 1-compound, up to 4 feet in length, and lanceolate in general outline. The individual pinnae are also lanceolate in outline and margined with recurved, doubly serrate teeth, each of which is tipped with a strong prickle. A conspicuous ear-like projection is found at the base of each of the pinnae upon the upper side. The stalks of the fronds are covered with chaffy brown scales which are also present along the midvein of the frond upon its under side. Spores are borne in large, conspicuous round clusters (sori). It is sometimes called Christmas fern because of its resemblance to an eastern species in the same genus.

Mountain hollyfern (*Polystichum lonchitis* (L.) Roth.). A beautiful but rather uncommon plant found in situations similar to the swordfern. The fronds, 6 to 30 inches long, oblong-lanceolate in outline, and 1 to 3 inches wide, are evergreen and grow in an erect, widespreading tuft. Pinnae are oblong-lanceolate in outline (except those at the base of the frond which are fan-shaped or triangular) with sharply toothed margins which lend a hollylike appearance to the plant.

Anderson hollyfern (*Polystichum andersoni* Hopkins). Rare in the park. Prefers a habitat similar to the swordfern. Fronds are tufted, 16 to 40 inches long, and 1-compound. Pinnae are deeply cleft into numerous pinnules or segments with irregularly toothed margins.

Mountain or triangular woodfern (*Dryopteris dilatata* (Hoffm.) Gray). The common name is derived from the broad, triangular shape of the fronds which are 2- to 3-compound, from 4 to 16 inches wide at the base, and from 12 to 40 inches long. The pinnae are deeply cleft with pinnules, in turn, having deeply cleft mucronate lobes. This plant is one of the most common ferns in the deep shaded woods at the lower elevations and, as it is often an associate of the lady or swamp fern, it is occasionally confused with that species. However, the triangular shape of the fronds of the mountain woodfern readily serves as an identifying character.

Oakfern (*Dryopteris disjuncta*). A very common, delicately beautiful fern of the deeply shaded woods up to about 3,500 feet. The slender, brownish leafstalk divides about 5 to 14 inches above the ground into three pinnae of almost equal size. These lie at right angles to the stem in a horizontal plane and are broadly triangular in general outline, being from 3 to 10 inches wide at the base. The pinnules are sessile, with crenate margins.

Sierra woodfern (*Dryopteris nevadensis* (D. C. Eaton) Underw.). Very rare in the park and not likely to be encountered by the average visitor.

Malefern (*Dryopteris filixmas* (L.) Schott.). Rather rare in the park. Found in shaded woods below 4,000 feet. Fronds are 12 to 48 inches long, 4 to 12 inches wide, oblong-lanceolate in outline, and 1-compound. Pinnae with oblique teeth on margins of their segments.

Brittle bladderfern (*Cystopteris fragilis* (L.) Bernh.). Rather rare in the park, although it may be encountered from 2,500 to 6,000 feet. It has a graceful appearance, with loose-spreading fronds from 4 to 16 inches long and 1 to 3 inches wide which are ovate-lanceolate in general outline and 1- to 2-compound. Pinnae are short-stalked, ovate-lanceolate in outline, and with rounded teeth on the margin of the pinnules. The leafstalk is slender, fragile, and strawcolored.

HORSETAIL FAMILY (EQUISETACEAE)

Most everyone is acquainted with this group of spore-bearing plants. Their characteristic rounded, ridged, and conspicuously jointed hollow stems with toothed sheaths covering the joints, and the whorls of bristly, linear leaves readily identify them. There are four species of horsetails native to the park.

Scouringrush (*Equisetum hyemale* L.). Aerial stems evergreen and perennial; spore-bearing and non-spore bearing stems alike in appearance; 1½ to 6 feet tall; found in soils of ample moisture.

Swamp horsetail (*Equisetum limosum* L.). Aerial stems not evergreen; all stems essentially alike; fertile stems with numerous whorls of branches; 18 to 36 inches tall; found in wet to swampy soils.

Field horsetail (*Equisetum arvense* L.). Aerial stems annual; 4 to 18 inches tall; sterile and reproductive stems different in appearance, the sterile stems being green with whorled branches at the joints.

Giant horsetail (*Equisetum telmateia* Ehrh.). Aerial stems annual, 1½ to 9 feet tall. Sterile stems ivory-grey, green, or brownish.

CLUBMOSS FAMILY (LYCOPODIACEAE)

These plants are evergreens with trailing stems covered by short, overlapping, moss-like leaves. The fir clubmoss bears its sporophylls in the axils of the leaves; the other species are characterized by upright, sparsely leaved branches which bear groups of club-like, elongated sporophylls which are generally arranged "candelabra" fashion. Five species are found in this area—*stiff clubmoss* (*Lycopodium annotinum* L.), *runningpine* (*Lycopodium clavatum* L.), *groundcedar* (*Lycopodium complanatum* L.), *fir clubmoss* (*Lycopodium selago* L.), and *Alaskan clubmoss* (*Lycopodium sitchense* Rupr.).

SELAGINELLA FAMILY (SELAGINELLACEAE)

This plant family, of which there is but one species native to Mount Rainier National Park—*Wallace selaginella* (*Selaginella wallacei* Hieron)—resembles the clubmosses and can be easily confused with them by the layman. Selaginella, however, bears two kinds of spores. The stems are short and densely tufted, and the small leaves are arranged in four rows to make the stems appear 4-sided in cross section.

QUILLWORT FAMILY (ISOETACEAE)

Both species of this family found in Mount Rainier National Park grow in boggy soils or about the margins of small lakes or ponds. They are small plants with tufted, grass-like or quill-like leaves which overlap at the base and which arise from a short, fleshy, onion-like stem. The two native species are *Brauns quillwort* (*Isoetes brauni* Dur.) which grows in locations which are submerged during part of the year and *Bolander quillwort* (*Isoetes bolanderi* Engelm.) which inhabits locations submerged throughout the entire year.

YEW FAMILY (TAXACEAE)

Pacific yew (*Taxus brevifolia* Nutt.). A fairly common tree in the park up to about 4,000 feet. The trunk is characteristically ridged and fluted with thin, reddish-brown bark that scales off in irregular plates to expose the rose-red inner bark to view. Foliage is evergreen, needle-like, flat, soft to the touch, and dark yellow-green on the upper side and light yellow-green beneath. Individual needles are about three-quarters of an inch long and tipped with a short, slender point. This is not a cone-bearing tree but because of its needle-like, evergreen foliage it often is confused with the

coniferous trees and so goes unnoticed in the coniferous forest. The seed is hard and greenish and is partly enclosed by a bright red, fleshy aril.

PINE FAMILY (PINACEAE)

The forests of Mount Rainier National Park are composed almost entirely of members of the pine family, all of which are evergreen and bear their seeds in woody cones or, in the case of the mountain common juniper, in a firm, bluish, berry-like globe. A field key to the various genera, and, in some cases, species, follows:

- 1. Trees 2
- 1. Trailing, prostrate shrub; needles awl-shaped; fruit berry-like . .
Mountain common juniper (*Juniperus communis* var. *saxatilis*)
- 2. Foliage needle-like 3
- 2. Foliage scale-like 7
- 3. Needles borne singly on the branches 4
- 3. Needles borne in clusters of from 2 to 5 *Pines* (*Pinus* spp.)
- 4. Twigs and branchlets rough due to presence of persistent, woody leaf bases 5
- 4. Twigs and branchlets not rough; no persistent leaf bases present . . 6
- 5. Twigs very rough, with erect bases; pedestal-like woody bases; needles sharp-pointed and prickly to the touch . . *Spruces* (*Picea* spp.)
- 5. Leaf bases not erect; needles not prickly . . . *Hemlocks* (*Tsuga* spp.)
- 6. Cones erect and borne upon upper branches of the tree. Needles sessile, broadened at base; leaf scars oval and conspicuous
True firs (*Abies* spp.)
- 6. Cones pendant, not limited to upper branches of the tree; needles narrowed at base; leaf scars small and not oval *Douglas-fir*
(Common douglasfir) (*Pseudotsuga taxifolia*)
- 7. Cones round—about half an inch or less in diameter; branches drooping in characteristic “wilted” appearance . *Alaska yellow-cedar*
(Nootka falsecypress) (*Chamaecyparis nootkatensis*)
- 7. Cones oblong—about half an inch to three-quarters of an inch long; branches with graceful spreading, fern-like appearance . . . *Western red-cedar* (Giant arborvitae) (*Thuja plicata*)

Western white pine (*Pinus monticola* Lamb.) Although encountered from the lower park boundaries to 5,000 feet, it is most common between the 3,500- and 4,500-foot levels. The foliage is a deep blue-green with individual needles (2 to 4 inches long) borne five in a bundle. Cones, which mature at the end of the second season, are 6 to 12 inches long, 2 to 3 inches in diameter, and very resinous. The bark is smooth and light grey on young trees, but on mature specimens it is dark ash-grey and broken up into numerous small plates.

Whitebark pine (*Pinus albicaulis* Engelm.). A picturesque timber-line tree in Mount Rainier National Park. It is very common in Yakima Park, where it replaces the mountain hemlock as the chief associate of the alpine fir. The foliage is a dark yellow-green with the needles (1 to 3 inches long) being borne five in a bundle. The cones, mature at the end of the second season, are 2½ to 3 inches long, purple-brown, and have thick, woody scales.

Lodgepole pine (*Pinus contorta* Loud. var. *latifolia* Engelm.). Although relatively unimportant in the forests of the park, it will be readily found on the Trail of the Shadows at Longmire and in the White River public campground. Foliage is a dark yellow-green, with individual needles (1 to 3 inches long) borne two in a cluster. Cones are small, 1 to 3 inches long, with thick woody scales which are each armed with a stout prickle at the apex.

Ponderosa pine (*Pinus ponderosa* Lawson). Common on the east side of the Cascade Range but extremely rare in the park. Foliage is dark yellow-green, the needles (4 to 10 inches long), being borne in dense clusters at the ends of the branches, and either two or three to a bundle.

Engelmann spruce (*Picea engelmanni* (Parry) Engelm.) Found only on the north side of the park. Most readily noted in the White River public campground and along the Wonderland or Northern Loop Trails from Yakima Park to Carbon River between the 4,500 and 6,500 foot elevations. Its principal characteristic is the harsh, stiff, pointed needles which are 4-sided in cross section and very prickly to the touch. Individual needles are borne singly on small, woody, upright leaf bases which persist after the needles have dropped off to give the naked twigs a rough appearance. Cones are borne abundantly, are about 2 inches long, are a light glossy brown, and have numerous thin, papery scales.

Sitka spruce (*Picea sitchensis* (Bong.) Carr.). Extremely rare in the park and not likely to be found by the average visitor. Individuals may be noted occasionally up to 2,600 feet in the Carbon and Puyallup River Valleys on the west side of the park. Needles are light green, are borne singly upon persistent woody bases, and are distinctly flattened.

Western hemlock (Pacific hemlock) (*Tsuga heterophylla* (Raf.) Sarg.). One of the most common trees in the park, occurring from the lower park boundaries to about 5,000 feet. It attains a large size, often being 2 to 5 feet in diameter and from 100 to 200 feet tall. Mature trunks have deeply furrowed, scaly bark that is dark reddish-brown to almost black. Inner bark is a deep maroon-red. The dark, glossy foliage is characterized by numerous needles of irregular length which lends a lacy appearance to the tree. Individual needles are flat, quarter of an inch to 1 inch long, soft to the touch, blunt at the tip and narrowed at the base into a short, slender leafstalk. The small cones, three-quarters of an inch to 1 inch long, are produced in great numbers and are borne at the tips of the branchlets. An-

other feature by which it may often be recognized is the weak, drooping central leader which is characteristic of all hemlocks.

Mountain hemlock (*Tsuga mertensiana* (Bong.) Sarg.). One of the most common trees of the subalpine and timber line regions in the park. It may be readily distinguished from the alpine fir, its principal associate, by its weak drooping central leader and the graceful sweep of its branches which lift upward at the ends. The foliage is very dense and dark green, with individual needles rather plump instead of flat, as in the case of the hemlock of the lower elevations. The cones are one of the tree's most attractive features. These are $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long and, before maturity, are a deep violet-purple.

Douglas-fir (Common douglasfir) (*Pseudotsuga taxifolia* (LaMarck) Britt.). This species is easily "king" of the forests of the park. Although most common in the deep forests of the lower slopes, it may be found up to 4,500 feet. Its large size, deeply furrowed cinnamon-brown bark, and distinctive pendant cones with their numerous 3-pointed bracts protruding from between the scales are its most characteristic features. Bark on young trees is a dark ash-grey color. The foliage is yellow-green, soft to the touch, with individual needles borne singly on the stem and narrowed at the base into a slender leafstalk.

Grand fir (*Abies grandis* Lindley). The least common of four species of true firs in the park found sparingly below 2,500 feet in elevation. Foliage is flat and yellow-green, with individual needles 1 to 2 inches long, soft to the touch, grooved, distinctly notched at the apex, and with two broad silvery-white stripes (rows of stomata) upon the under side. By a conspicuous twist at the base, the individual needles grow at right angles to the branch in a flat comb-like arrangement so that many persons compare the arrangement of the foliage on the branch to "hair parted in the middle." This is an excellent character of identification and one by which this tree may be most readily distinguished from its common associate, the Pacific silver fir, with which it is often confused. As is characteristic of all true firs, the leaf scars are oval and conspicuous, and the cones, erect upon the branches, disintegrate at maturity.

Pacific silver fir (Cascades fir) (*Abies amabilis* (Loud.) Forbes). One of the most widely distributed trees in the park, occurring up to the lower limits of the Hudsonian Zone. The foliage is deep blue-green and glossy, with individual needles 1 to $1\frac{1}{2}$ inches long, flat, soft to the touch, generally notched at the apex, and with two broad silvery stripes (stomata) on the under side. As in the case of all true firs, the needles, when pulled from the branch, leave a conspicuous oval leaf scar. Needles clothe the branches thickly, extending in a horizontal plane on either side of the branch as well as lying along its upper surface—a factor which readily distinguishes it from the grand fir with which it is often confused. The handsome cones are 4 to 6 inches long, $2\frac{1}{2}$ inches in diameter, and a beautiful deep purple.

They stand erect upon the upper branches of the tree and disintegrate at maturity, as is characteristic of all true firs. Bark is smooth, ash-grey, and seldom furrowed.

Noble fir (*Abies procera*). A common tree of the upper Canadian Zone between 3,500 and 4,800 feet. The bark is dark grey and broken up into numerous small plates of irregular size. The foliage is a deep blue-green with a silvery cast. Individual needles are three-quarters of an inch to 1½ inches long, those upon the upper branches being plump, pointed, densely massed, and curved upward, while those on the lower parts of the tree are flat. The cones, one of the tree's most distinctive features, are 4 to 6 inches long, 2 to 3 inches in diameter, and yellow-green at maturity. Numerous bracts protrude from between the scales and bend down along the side of the cone giving it a "shingled" appearance. As in all true firs, the cones stand upright on the upper branches of the tree and disintegrate at maturity.

Alpine fir (*Abies lasiocarpa* (Hook.) Nutt.). The most common tree of the subalpine and timber line zones in the park. Because of its compact, long, spire-like form, many persons regard it as our most beautiful conifer. Its habit of forming artistic "family groups" with the large trees in the center and seedlings on the outside is an attractive feature of the Hudsonian meadows. Cones are borne upright on the upper branches of the tree, are 2 to 4 inches long and 1 to 1½ inches in diameter, resinous, flat-topped, and a deep blue. Foliage is dark green, soft to the touch, flat and broadened at the base so that, in common with all true firs, the leaf scars are round and conspicuous.

Western red-cedar (Giant arborvitae) (*Thuja plicata* D. Don.). One of the most common trees of the lower elevations. Its most distinguishing feature is the closely overlapping, scale-like foliage which gives a fern-like appearance to the branches and identifies it, the western red-cedar, as a relative of the arborvitae of the East. Cones are small and oblong, half an inch to three-quarters of an inch long, and produced in large quantities. The bark is dark reddish-brown, shreddy, and fibrous. Trunks of old trees are buttressed and fluted at the base.

Alaska yellow-cedar (Nootka falsecypress) (*Chamaecyparis nootkatensis* (Lamb.) Sudw.). A conspicuous tree of the Canadian Zone between 3,000 and 5,000 feet. Foliage is scale-like, cones are small and globular, and the branches have a characteristic drooping appearance as if wilted. This latter character is particularly noticeable along the Paradise Valley Highway between Ricksecker Point and Narada Falls. The bark is ash-grey and flaky in appearance.

Mountain common juniper (*Juniperus communis* L. var. *saxatilis*). A spreading, prostrate shrub common on rocky locations up to timber line. Needles are arranged in whorls of three, are sharp-pointed and whitish, and usually concave and curved. Fruit is a firm bluish berry.

CATTAIL FAMILY (TYPHACEAE)

Common cattail (*Typha latifolia* L.). Most persons are familiar with this plant which is widely distributed throughout North America. It is found in marshy situations or along the borders of ponds in the park, such as in the boggy meadow near Longmire where it is quite common. It grows to a height of 3 to 5 feet and both staminate and pistillate flowers are borne together in a dense, brown, cylindrical spike.

BURREED FAMILY (SPARGANIACEAE)

Burreed (*Sparganium* spp.). Three species of burreed are native to Mount Rainier National Park. All are water plants, growing along the edges of lakes or ponds. The leaves are linear and grass-like and their greenish flowers are clustered in compact spherical burr-like heads which are scattered along the upper portion of the stem in or above the leaf axils. *Sparganium simplex* Huds. has rather stout stems that stand erect above the surface of the water. *Sparganium minimum* Fries has slender stems with thin floating leaves. The flower heads of this species are sessile or nearly so and slightly less than quarter of an inch in diameter. This species is quite common along the margin of Reflection Lake. *Sparganium angustifolium* Michx. has fruiting heads about twice as large as those of *S. minimum* and they are sometimes attached to the stem by a short stalk. While the leaves of this species are floating they are rather firm.

PONDWEED FAMILY (NAIADACEAE)

Floatingleaf pondweed (*Potamogeton natans* L.). A water plant characterized by two kinds of leaves—floating and submerged. The former are ovate or elliptical in outline, somewhat heart-shaped at the base, and 2 to 3 inches long. The submerged leaves are long and grass-like. This plant is very rare in the park. So far as is now known it is found only in Tahoma Creek.

GRASS FAMILY (GRAMINEAE)

From an economic point of view this is the most important of plant families. It furnishes all our cereal foods, such as wheat, rice, barley, oats, and corn, as well as the bulk of the forage for domestic animals. Grasses are also used extensively in industrial arts and landscape beautification. Geographically they are distributed over all sections of the land surfaces of the earth—in marshes, on deserts, on prairies, in woodlands. They are found from the tropics to the poles and from sea level to perpetual snow upon our high mountains.

However, grass flowers, being designed for wind pollination, are not showy or conspicuous and are not of great interest to most persons. For that reason individual species native to Mount Rainier National Park are merely

listed below rather than described in detail. For more complete data on these interesting plants one should refer to the *Manual of the Grasses of the United States* by A. S. Hitchcock.

<i>Agropyron pauciflorum</i> (Schwein.) Hitchc. . . .	Slender wheatgrass
<i>Agropyron smithi</i> Rydb.	Bluestem wheatgrass
<i>Agrostis aequivallis</i> (Trin.) Trin.	Alaska bentgrass
<i>Agrostis alba</i> L.	Redtop
<i>Agrostis diegoensis</i> Vasey	Thin bentgrass
<i>Agrostis exarata</i> Trin.	Spike bentgrass
<i>Agrostis hiemalis</i> (Walt.) B. S. P.	Winter bentgrass
<i>Agrostis hiemalis</i> (Walt.) B. S. P., var. <i>geminata</i> (Trin.) Hitchc.	Arctic winter bentgrass
<i>Agrostis humilis</i> Vasey	Alpine bentgrass
<i>Agrostis idahoensis</i> Nash.	Idaho bentgrass
<i>Agrostis oregonensis</i> Vasey.	Oregon bentgrass
<i>Agrostis rossae</i> Vasey.	Ross bentgrass
<i>Agrostis tenuis</i> Sibth	Colonial bentgrass
<i>Agrostis thurberiana</i> Hitchc.	Thurber bentgrass
<i>Aira caryophyllea</i> L.	Silver hairgrass
<i>Aira praecox</i> L.	Early hairgrass
<i>Bromus carinatus</i> Hook & Arn	Mountain brome
<i>Bromus commutatus</i> Schrad	Hairy brome
<i>Bromus tectorum</i> L.	Cheatgrass brome
<i>Bromus vulgaris</i> (Hook.) Shear.	Columbia brome
<i>Calamagrostis canadensis</i> (Michx.) Beauv. . . .	Bluejoint reedgrass
<i>Calamagrostis purpurascens</i> R. Br.	Purple pinegrass
<i>Cinna latifolia</i> (Trevir.) Griseb	Drooping woodreed
<i>Cynosurus cristatus</i> L.	Crested dogtail
<i>Dactylis glomerata</i> L.	Orchardgrass
<i>Danthonia intermedia</i> Vasey	Timber danthonia
<i>Deschampsia atropurpurea</i> (Wahl.) Scheele . . .	Mountain hairgrass
<i>Deschampsia caespitosa</i> (L.) Beauv.	Tufted hairgrass
<i>Deschampsia danthonioides</i> (Trin.) Munro . . .	Annual hairgrass
<i>Deschampsia elongata</i> (Hook.) Munro	Slender hairgrass
<i>Elymus glaucus</i> Buckl.	Blue wildrye
<i>Elymus virescens</i> Piper	Pacific wildrye
<i>Festuca elatior</i> L.	Meadow fescue
<i>Festuca microstachys</i> (Nutt.)	Small fescue
<i>Festuca occidentalis</i> Hook	Western fescue
<i>Festuca ovina</i> L., var. <i>brachyphylla</i> (Schulte).	

<i>Festuca Piper.</i>	Alpine fescue
<i>Festuca subulata</i> Trin.	Bearded fescue
<i>Festuca viridula</i> Vasey	Green fescue
<i>Glyceria borealis</i> (Nash) Batch.	Northern mannagrass
<i>Glyceria elata</i> (Nash) Hitchc.	Tall mannagrass
<i>Glyceria pauciflora</i> Presl.	Weak mannagrass
<i>Holcus lanatus</i> L.	Common velvetgrass
<i>Hordeum jubatum</i> L.	Foxtail barley
<i>Lolium multiflorum</i> Lam.	Italian ryegrass
<i>Melica subulata</i> (Griseb.) Scribn.	Alaska oniongrass
<i>Muhlenbergia filiformis</i> (Thurb.) Rydb	Pullup muhly
<i>Phleum alpinum</i> L.	Alpine timothy
<i>Phleum pratense</i> L.	Timothy
<i>Pleuropogon refractus</i> (A. Gray) Benth.	Nodding semaphoregrass
<i>Poa annua</i> L.	Annual bluegrass
<i>Poa arctica</i> R. Br.	Arctic bluegrass
<i>Poa epilis</i> Scribn.	Skyline bluegrass
<i>Poa gracillima</i> Vasey	Slender bluegrass
<i>Poa lettermani</i> Vasey	Letterman bluegrass
<i>Poa macroclada</i> Rydb.	
<i>Poa nervosa</i> (Hook.) Vasey	Wheeler bluegrass
<i>Poa pratensis</i> L.	Kentucky bluegrass
<i>Poa pringlei</i> Scribn.	Pringle bluegrass
<i>Poa scabrella</i> (Thurb.) Benth.	Pine bluegrass
<i>Poa stenantha</i> Trin.	Trinius bluegrass
<i>Polypogon monspeliensis</i> (L.) Desf.	Rabbitfoot polypogon
<i>Puccinellia distans</i> (L.) Parl	Weeping alkaligrass
<i>Setaria viridis</i> (L.) Beauv.	Green bristlegrass
<i>Sitanion hansenii</i> (Scribn.) J. G. Smith	Hansen squirreltail
<i>Sitanion hystrix</i> (Nutt.) J. G. Smith	Bottlebrush squirreltail
<i>Stipa occidentalis</i> Thurb.	Western needlegrass
<i>Trisetum canescens</i> Buckl.	Tall trisetum
<i>Trisetum cernuum</i> Trin.	Nodding trisetum
<i>Trisetum spicatum</i> (L.) Richt.	Spike trisetum

SEDGE FAMILY (CYPERACEAE)

Sedges are quite abundant in Mount Rainier National Park, particularly in moist to wet soils. Although often confused with the grasses, they can be

easily distinguished in that they have triangular stems which lack nodes or joints. With the exception of the *Cottonsedge*, of which two species are native to the park, the sedges are given little attention by the average visitor. Hence most of the native species are merely listed.

Narrowleaf cottonsedge (*Eriophorum angustifolium* Roth.) A very common plant which often occurs in considerable quantity in wet, boggy soils in the Canadian and Hudsonian Zones. It can be readily recognized by the tufts of soft, white, cottony bristles which occur at the apex of the plant. Another species (*C. chamissones*) is also found in this area. This is found at lower elevations than the first named species and the bristles are usually brownish.

<i>Carex ablata</i> Bailey	<i>Carex laeviculmis</i> Miensh.
<i>Carex accedens</i> Holm.	<i>Carex leptalea</i> Wahl.
<i>Carex amplifolia</i> Boott.	<i>Carex limosa</i> L.
<i>Carex arcta</i> Boott.	<i>Carex leparinella</i> Mackenzie
<i>Carex brunescens</i> (Pers.) Poir.	<i>Carex mertensi</i> Prescott
<i>Carex bolanderi</i> Olney.	<i>Carex neurophora</i> Mack.
<i>Carex canescens</i> L.	<i>Carex nigricans</i> Meyer
<i>Carex cephalantha</i> (Bailey) Bickn.	<i>Carex pachystachya</i> Cham.
<i>Carex cusicki</i> Mack.	<i>Carex phaeocephala</i> Piper
<i>Carex engelmanni</i> Bailey	<i>Carex presli</i> Steud.
<i>Carex exsiccata</i> Bailey	<i>Carex podocarpa</i> R. Br.
<i>Carex festivella</i> Mackenzie	<i>Carex pyrenaica</i> Wahl.
<i>Carex geyeri</i> Boott.	<i>Carex praticola</i> Rydb.
<i>Carex gymnoclada</i> Holm.	<i>Carex rossi</i> Boott.
<i>Carex hepburni</i> Boott.	<i>Carex rostrata</i> Stokes
<i>Carex hoodi</i> Boott.	<i>Carex spectabilis</i> Dewey
<i>Carex illota</i> Bailey	<i>Scirpus caespitosus</i> L.
<i>Carex kellogi</i> Boott.	<i>Scirpus microcarpus</i> Presl.

ARUM FAMILY (ARACEAE)

American yellowskunkcabbage (*Lysichitum americanum* Hulten & St. John). One of the most common plants at the lower elevations of the park, found in wet to boggy soils to about the 3,000-foot elevation. The leaves are oblong in outline and very large (12 to 36 inches long and 8 to 20 inches wide). It is one of the first plants to bloom in the early spring, vying with the butterbur. At that time its bright yellow corolla-like spathe, which partially encloses the club-like spike of small flowers of the same color, is very conspicuous. Its rootstock is thick and horizontal in the marshy soil. The common name is derived from the pungent, skunk-like odor which this plant possesses.

RUSH FAMILY (JUNCACEAE)

These plants are grass-like in appearance and receive little attention from the park visitor. For this reason the species known to inhabit this area are merely listed.

Juncus balticus Willd.

Juncus bufonius L.

Juncus covillei Piper

Juncus drummondii E. Mey.

Juncus filiformis L.

Juncus mertensianus Bong.

Juncus parryi Engelm.

Juncus regeli Buch.

Juncus xiphioides E. Mey.

Luzula comosa E. Mey.

Luzula divaricata S. Wats.

Luzula glabrata (Hoppe) Desv.

Luzula parviflora (Ehrh.) Desv.

Luzula wahlenbergii Rupr.

Luzula spicata (L.) DC.

LILY FAMILY (LILIACEAE)

This family includes many of the most common plants of this region. They are characterized by undivided, parallel-veined leaves and flower parts in 3's or 6's. Petals and sepals are alike.

1. Leaves linear. 2
1. Leaves not linear; lanceolate or broader; fruit often juicy. 6
2. Flowers in umbels; plant with onion odor. *Onion* (*Allium* spp.) (p. 55)
2. Flowers not in umbels; plant not with onion odor 3
3. Flower usually solitary on stem; leaves linear; plant small, 2 to 4 inches tall *Common alplily* (*Lloydia serotina*) (p. 56)
3. Flowers in racemes, numerous 4
4. Plant usually more than 2 feet tall; leaves chiefly in a dense basal tuft, rough-edged and harsh to touch; flowers white, in dense terminal raceme *Common beargrass* (*Xerophyllum tenax*) (p. 58)
4. Plant 10 to 20 inches tall; leaves basal but not rough-edged or harsh to the touch 5
5. Flowers purplish-brown, pendent, in open raceme
Western stenanthium (*Stenanthium occidentale*) (p. 57)
5. Flowers white, not pendent, in dense raceme
Tall tofieldia (*Tofieldia occidentalis*) (p. 58)
6. Stems not leafy. 7
6. Stems leafy. 8
7. Flowers 1 to several per stem, white or yellow; fruit a dry 3-angled capsule *Fawnlily* (*Erythronium* spp.) (p. 56)
7. Flowers 1 per stem, white, fruit a fleshy turquoise berry
Queencup beادلily (*Clintonia uniflora*) (p. 55)
8. Flowers 1 per stem *Pacific trillium* (*Trillium ovatum*) (p. 58)
8. Flowers 1 to many per stem 9

9. Flowers brownish; petals spotted	10
9. Flowers not as above, but white, greenish, or rose-colored; petals not spotted.	11
10. Flowers brownish-purple, bell-shaped, nodding on stem; petals with greenish-yellow spots	
<i>Riceroor fritillary</i> (<i>Fritillaria lanceolata</i>) (p. 56)	
10. Flowers tawny orange with dark purple-brown spots	
<i>Columbia lily</i> (<i>Lilium columbianum</i>) (p. 56)	
11. Plant very large, 3 to 5 feet tall; leaves large, clasping and plaited; flowers borne in a "corn-tassel-like" panicle; fruit dry	
<i>Falsehellebore</i> (<i>Veratrum</i> spp.) (p. 58)	
11. Plants not as large as above; flowers not as above, fruit juicy . .	12
12. Stems not branched; flowers in a raceme or panicle at ends of stems.	<i>Solomonplume</i> (<i>Smilacina</i> spp.) (p. 57)
12. Stems branched.	13
13. Leaves cordate; flowers white, in close raceme	
<i>Beadruby</i> (<i>Maianthemum dilatatum</i>) (p. 57)	
13. Leaves not cordate	14
14. Flowers solitary in axils of leaves	
<i>Twistedstalk</i> (<i>Streptopus</i> spp.) (p. 57)	
14. Flowers terminal in 2's or 3's.	
<i>Oregon fairybells</i> (<i>Disporum oregonum</i>) (p. 56)	

Pacific onion (*Allium validum* Wats.). This plant is 10 to 24 inches tall with deep rose-colored flowers in a dense cluster (an umbel) at the apex of the erect stem. The leaves are narrow, linear to lanceolate, with the basal leaves sheathing the stem at its base. The plant has an onion odor when bruised. The bulb is on a rather long, stout rhizome. It is common in moist situations, such as mountain meadows in the northwest section of the park.

Nodding onion (*Allium cernuum* Roth.). The common name of this species is derived from the slender, nodding stem, a character by which it may be readily recognized from the Pacific onion. A cluster of pink flowers is borne at the end of this nodding stem. The bulb is on a short rhizome; often clustered. This species is characteristic of dry rocky soils and has been collected in such localities on Mount Wow.

Queencup beadlily (*Clintonia uniflora* (Schultz) Kunth.). Known also as queen's cup, this is one of the most common plants of the deep woods. The single white flower is borne at the apex of a short slender stem from 2 to 5 inches tall. The segments of the flower cup are six in number, equal in size, distinct from one another and spreading. The leaves, generally two to three in number, are basal, 4 to 6 inches long, and oblong in outline. The fruit is a beautiful turquoise berry.

Oregon fairybells (*Disporum oregonum* (Wats.) B. & H.). A plant of the deep woods. Stems are 12 to 30 inches long, much-branched and leafy with alternate, sessile clasping leaves which are oval in outline, heart-shaped at the base, and pointed at the tip. The white or cream-colored flowers are borne singly or in a loose cluster of two to three at the ends of the branches. The flower is quarter of an inch to three-eighths of an inch long, bell-like in form, and usually hidden beneath the foliage. The fruit is a handsome berry, yellow at first and later turning a bright red.

Avalanche fawnlily (*Erythronium montanum* Wats.). One of the most common and best-known flowers of the Hudsonian meadows. Locally known simply as avalanche lily, it is among the earliest plants to bloom at this elevation in the park, often pushing its way through the edges of receding snowbanks to form dense fields of flowers that are one of the most striking features of the area during the latter part of June and early July. The large, nodding white flowers are about 2 inches across. There may be one or several on a stem. Occasionally as many as 10 or 12 are found on one stalk. The six segments of the blossom are recurved, and pure white, except for a yellow area at the base of each one upon its inner side. The avalanche fawnlily is also known as dogtooth violet, adderstongue, and deertongue.

Lambstongue fawnlily (*Erythronium grandiflorum* Pursh. var. *pallidum* St. John). This plant, locally known as glacierlily, is similar in general form to the avalanche fawnlily except that it is smaller and has a bright golden-yellow blossom. There is rarely more than one blossom on each stalk. Because it blooms somewhat earlier in the season and is not quite as abundant as the avalanche fawnlily, this beautiful plant is not so well known.

Riceroot fritillary (*Fritillaria lanceolata* Pursh.). A plant from 12 to 36 inches tall with from one to six rather large, nodding, bell-like purple-brown flowers whose petals are spotted with greenish-yellow. The leaves are narrow and stemless.

Columbia lily (*Lilium columbianum* Hans.). This is a handsome plant from 15 to 40 inches tall, having large tawny-orange flowers with dark purple-brown spots which accounts for a local common name of tigerlily. It is quite common on rather dry soils in the Hudsonian Zone but is not strictly limited to that altitudinal range. The flowers nod at the ends of slender stems and the segments of the blossoms are spreading and recurved. The leaves are mostly in whorls on the stem, oblanceolate in outline, and from 2 to 4 inches long.

Alplily (*Lloydia serotina* (L.) Sweet.). A slender, low plant with linear grass-like leaves; a rare plant of the Hudsonian Zone. The small creamy-white flower is tinged with purple and borne singly on the stem; the segments of the blossom are recurved.

Beadruby (*Maianthemum dilatatum* (Wood) Nels. & Macbr.). Also known locally as wild lily-of-the-valley. A plant of the moist deep woods, common up to 4,000 feet. The ovate to lanceolate glossy deep-green leaves are heart-shaped at the base and acute pointed at the tips. The entire plant is from 6 to 8 inches tall and has numerous small white flowers borne at the end of the stem in a close raceme.

Starry solomonplume (*Smilacina stellata* (L.) Desf.). Known locally as star-flowered solomonseal, this is a common plant of the moist, wooded regions of the park. It is often found in large patches up to 3,500 feet in elevation. It is 6 to 15 inches tall, with oblong-lanceolate, alternate leaves without leafstalks. The small white starlike flowers are borne in a loose, simple, open cluster at the ends of the rather long, gracefully nodding, leafy, unbranched stems. The fruit, when ripe, is an attractive red berry.

Fat solomonplume (*Smilacina amplexicaulis* Nutt.). Known locally as false solomonseal, this is a larger plant than the starry solomonplume, being 16 to 40 inches tall. The leaves, which are 2½ to 5 inches long, are without leafstalks and partially enfold the stems of the plant at their bases. The numerous small white flowers are borne in a dense cluster (panicle) at the end of the gracefully nodding stem. This attractive plant is not as common as the starry solomonplume but grows under similar conditions of soil moisture.

Western stenanthium (*Stenanthium occidentale* Gray). A frequent but not abundant plant, from 8 to 20 inches tall, with drooping brownish to bronze-colored, bell-like flowers which are borne in a loose cluster—a raceme or panicle. The petals of the flowers are recurved and spreading. The leaves are linear to oblanceolate and about 4 to 8 inches long. As this plant grows in very moist to boggy situations, among grasses and other plants of that nature, it is often hidden from view and is apt to be overlooked.

Claspleaf twistedstalk (*Streptopus amplexifolius* (L.) DC.). A fairly common plant of the moist shaded woods. The gracefully nodding, branched stalk occasionally grows to be 3 feet long. The leaves are ovate in outline, acuminate at the tip, without leafstalks, and heart-shaped and clasping at the base. They are 2 to 4 inches long and alternate on the stem. The flowers are greenish-white to cream-colored, bell-like in general form but with the segments of the blossoms spreading and recurved. They are solitary in the upper leaf axils and are borne upon slender pedicels or stems which are twisted so that the flower is beneath the leaves and usually hidden from view. The fruit is a bright red berry.

Twistedstalk (*Streptopus streptopoides* (Ledeb.) Frye & Rigg). This plant has no distinguishing common name. The petals are widespreading and not bell-like in form, reddish at the base, and with yellowish-green recurved tips.

Rose-flowered twistedstalk (*Streptopus curvipes* Vail). As the common name implies, this plant has rose-colored flowers. The stems are simple

and unbranched, and the tips of the segments of the blossoms are not recurved.

Tall tofieldia (*Tofieldia occidentalis* Wats.). This plant, 4 to 12 inches tall, grows in very moist to boggy situations. The leaves are long (2 to 8 inches in length), and linear, and the small white flowers are borne in a dense raceme. The fruit is a rather showy purplish, many-seeded capsule. Also known locally as bogasphodel.

Pacific trillium (*Trillium ovatum* Pursh.). Many persons are familiar with this beautiful and common plant of the moist woods. In this national park it occurs up to 4,000 feet. It is one of the early spring plants at the lower elevations, and as the season advances it may be readily found in full bloom at those higher levels of its altitudinal range. As the common and generic names imply, the leaves and petals are in 3's. The petals at first are pure white but turn a dark rose color with age. The leaves are broadly ovate and pointed at the tip, and the single flower is borne at the apex of the stout stem which is 8 to 16 inches tall. (See frontispiece).

Eschscholtz falsehellebore (*Veratrum eschscholtzi* Gray.). A very large, common and conspicuous plant of the Hudsonian meadows known locally as green or giant hellebore. It grows 3 to 5 feet tall and is characterized by large, plaited leaves which encircle the stem at their base. The leaves are also conspicuously parallel-veined. While the flowers are not attractive, being green, they are one of the most conspicuous features of this plant because they are borne in a striking "corn tassel" panicle at the apex of the tall, stout stem.

White falsehellebore (*Veratrum caudatum* Heller). This plant closely resembles *V. eschscholtzi* in general form but has white flowers and grows in boggy situations at the lower altitudes in the park. It is quite common in the Longmire meadow.

Common beargrass (*Xerophyllum tenax* (Pursh.) Nutt.). This very common and showy plant is found from the lower elevations to above timber line, in open situations and in rather dry soils. It is most common in the upper Canadian and lower Hudsonian Zones from about 4,500 to 5,500 feet, often occurring in great abundance. The leaves are long, linear, rough-edged and harsh to the touch, and are largely in dense basal tufts. The flower stalk is stout and bears at its apex a dense, club-like raceme of white flowers. The flowers at the base of the raceme bloom first so that the flowering period of the plant is quite long. This plant is also known as Indian basketgrass and squawgrass.

IRIS FAMILY (IRIDACEAE)

Idaho blue-eyedgrass (*Sisyrinchium idahoense* Bickn.). This is the only representative of the iris family in Mount Rainier National Park. It occurs in wet meadows and is quite common in the moist soils about the mineral springs at Longmire. The leaves are linear, pointed at the tip,



Figure 40.—AVALANCHE FAWN LILY (*Erythronium montanum*).

Figure 41.—BEADRUBY (*Maianthemum dilatatum*).





Figure 42.—STARRY SOLOMONPLUME (*Smilacina stellata*).



Figure 43.—FAT SOLOMONPLUME (*Smilacina amplexicaulis*).

Figure 44.—ESCH- ➔
SCHOLTZ FALSEHELLE-
BORE (*Veratrum esch-*
scholtzi). Asahel Curtis
Copyright Photo.





Figure 45.—COMMON BEARGRASS (*Xerophyllum tenax*).



Figure 46.—PACIFIC CORALROOT (*Corallorhiza mertensiana*).



Figure 47.—CALYPSO (*Calypso bulbosa*).

Figure 48.—STAMINATE AND PISTILLATE FLOWERS OF THE RED ALDER (*Alnus rubra*). BACKGROUND RULED IN INCH SQUARES.





Figure 49.—AMERICAN BISTORT (*Polygonum bistortoides*). Lindsley Photo.

Figure 50.—SPRINGBEAUTY (*Claytonia siberica*).





Figure 51.—WESTERN PASQUEFLOWER (*Anemone occidentalis*). Lindsley Photo.

Figure 52.—SEED PODS OF WESTERN PASQUEFLOWER (*Anemone occidentalis*). →
Lindsley Photo.





Figure 53.—ELKSLIP MARSHMARIGOLD.
(*Caltha leptosepala*).



Figure 54.—MOUNTAIN BUTTERCUP
(*Ranunculus eschscholtzi*).

Figure 55.—DEERFOOT VANILLALEAF (*Achlys triphylla*).



and long, but do not exceed the length of the stems. While leaves may occasionally be present on the stem, they are generally basal. The stems, 4 to 12 inches tall, are flattened and winged with finely toothed edges. The flowers, which are dark blue with a yellow center, are small and are borne on short stalks.

ORCHID FAMILY (ORCHIDACEAE)

This is one of the most interesting of the plant families in Mount Rainier National Park due to the highly specialized nature of the flowers, which are so constructed that they are practically dependent upon insects for pollinization. The flower has a very peculiar form, having three sepals and three petals, one of which is usually developed into a sac or spur called the "lip." This accounts for such oddly formed flowers as the ladyslipper. The stamens and pistil are united into a single column and the pollen is massed into two pear-like units, called pollinia, which are attached by stalks to a sticky disk. When an insect visits the flower in search of nectar, this entire unit sticks to its head or body. Twelve species of orchids are native to the park. A key to the genera follows:

- 1. Plant saprophytic or parasitic on roots of other plants 2
- 1. Plant not as above 3
- 2. Flowers spurred; plant red . . . *Coralroot* (*Corallorhiza* spp.) (p. 67)
- 2. Flowers not spurred; flowers white
Austin phantomorchid (*Cephalanthera austinae*) (p. 68)
- 3. Flower and leaf solitary on stem; plant bulbous
Calypso (*Calypso bulbosa*) (p. 68)
- 4. Leaves only 2 per stem and opposite. . . *Listera* (*Listera* spp.) (p. 68)
- 4. Leaves more than 2 per stem 5
- 5. Flowers with a distinct spur, greenish or white
Habenaria (*Habenaria* spp.) (p. 68)
- 5. Flowers spurless 6
- 6. Flower stem finely hairy, particularly above; leaves with white streak down center and forming a flat rosette at base of flower stem.*Western rattlesnakeplantain* (*Goodyera decipiens*) (p. 69)
- 6. Flower stem glabrous; leaves not in rosette
Continental ladiestresses (*Spiranthes romanzoffiana*) (p. 69)

Pacific coralroot (*Corallorhiza mertensiana* Bong.). The most common of three local species in this genus, all of which are saprophytic or parasitic on the roots of other plants. It is usually found growing in small colonies in the duff of the deep forest up to 3,500 or 4,000 feet in elevation. The entire plant—the stem, bract-like leaves, and flowers—is coral-red. The plant grows to a height of 4 to 16 inches and the 10 to 20 small, spurred flowers,

are borne in a terminal raceme. Another species (*Corallorhiza maculata* Raf.) may also be found quite often in similar situations, but in this case the plant is sometimes yellowish, is not generally as tall as *C. mertensiana*, and the lip of the flower is spotted with crimson. A third species (*Corallorhiza striata* Lindl.) is more often encountered in dry woods. Its flowers do not possess a spur and the sepals are characterized by three conspicuous veins. The common name of "coralroot" applies to all 3 species.

Austin phantomorchid (*Cephalanthera austinae* (Gray) Heller). A rare plant of the deep woods. It is entirely white and waxy in appearance and 6 to 15 inches tall. The flowers, 3 to 20 in number, are erect in a terminal raceme and almost sessile.

Calyпсо (*Calyпсо bulbosa* (L.) Oakes). This is one of the most beautiful plants of the lower elevations. The flower stem is but 2 to 5 inches long. It is wrapped at the base by several scales and bears at its apex a single slipper-like, drooping, delicately tinted flower. The petals are light purple, spreading, and lanceolate in outline. The slipper-like form of the blossom is due to the peculiar shape of the lip which is brownish-pink, spotted with purple. A tuft of yellow hairs is within the slipper-like lip. While not rare, this plant is not widely distributed, being found in the early summer in soils of the dense woods at the lower elevations (up to about 2,500 feet). Known locally as ladyslipper.

Listera. There are two species of this genus native to the park and both are common in the moist soils of the deep woods at the lower elevations. The single pair of broad, opposite leaves, borne about midway on the stem, readily characterizes these plants and accounts for the local common name of twayblade. The *Northwest listera* (*Listera caurina* (Piper) Rydb.), is the more common of the two species. It is 3 to 12 inches tall, with small spurless flowers upon slender pedicels borne in a terminal raceme. The other species, known as the *Northern listera* (*Listera cordata* R. Br.) may be readily distinguished by the cordate leaves.

White bogorchid (*Habenaria dilatata* (Pursh.) Hook.). This plant is quite common in marshy situations at the lower elevations, such as in the swampy meadow about the mineral springs at Longmire. The stout, hollow stems, 10 to 30 inches tall, bear numerous white flowers about half an inch long in a handsome terminal, compact spike. The numerous leaves are linear-lanceolate in outline and from 3 to 8 inches long.

Modoc habenaria (*Habenaria saccata* Greene.) This plant also prefers very moist soils but is more common in the Hudsonian Zone. The flowers, borne in a terminal spike, are green, and largely because of this the plant is not as handsome as the white bogorchid of the lower elevations. The leaves are oblong-lanceolate in outline. Also known locally as green swamp orchis.

Alaska habenaria (*Habenaria unalascensis* (Spreng.) Wats.). The leaves of this species are mainly basal, those on the stem being reduced to

mere bracts. They are usually two to three in number, oblanceolate in outline, obtuse, and about 6 inches long. These generally wither before the flowers bloom. The flowers are small, greenish, and borne in a spike.

Western rattlesnakeplantain (*Goodyera decipiens* (Hook.) Hubbard). Very common in moist soils in the deep woods. The leaves, ovate in outline and arranged in a flat rosette on the ground at the base of the flower stalk, have a whitish or cream-colored stripe down the middle which is an excellent character for field identification. The flower stalks are erect and from 6 to 12 inches tall. The flowers are compacted upon short bracted, 1-sided spikes from 2 to 4 inches long.

Continental ladiestresses (*Spiranthes romanoffiana* Cham.). The spirally twisted raceme of whitish or yellowish flowers readily identifies this plant. It is from 3 to 16 inches tall. The leaves at the lower portion of the stem are oblong-lanceolate to linear in outline and those on the upper portion of the stem are scale-like.

WILLOW FAMILY (SALICACEAE)

Two genera of plants are included in this family—the poplars (*Populus*) and the willows (*Salix*). All species in this family are either shrubs or trees having alternate leaves and small greenish to yellowish flowers borne in catkins. The staminate and pistillate catkins are on separate plants, with the fruit a capsule and seeds having a tuft of hairs. While the two genera are quite distinct in general character and are readily distinguished by the novice, the differences between the various species of willows are not always well-defined and their identification is often quite difficult.

Northern black cottonwood (*Populus trichocarpa* T&G var. *hastata* Henry). The largest deciduous tree in the park, mature specimens being 12 to 24 inches in diameter and 50 to 100 feet tall. It is generally found in moist soils up to about 4,000 feet. The bark on old trunks is ash-grey and deeply furrowed; on young trees (also branches and upper parts of older trees) it is smooth and light grey. Buds have several scales and are resinous. Leaves are broadly ovate and acute (2 to 5 inches wide at base and 3 to 6 inches long), thick and leathery in texture, smooth and shiny yellow-green above and silvery-grey beneath, with toothed margins and long stout petioles. The fruit consists of tiny seeds, each with a tuft of white hairs. These seeds are enclosed in globular, green capsules until ripe when they escape and are disseminated by the wind.

Willow (*Salix* spp.). Willows are characterized by usually narrow, short-petioled leaves and nonresinous buds having but one scale. The various species in the park range from small prostrate shrubs of the upper elevations to small trees which are found at lower levels. Species which are most apt to be noted by the average visitor are the *Sitka willow* (*Salix sitchensis*), *undergreen willow* (*Salix commutata*) and *arroyo willow* (*salix lasiolepis*). The following key is given to afford more specific determination.

1. Low, prostrate, alpine shrubs only a few inches high 2
1. Erect shrubs or small trees 3
2. Leaves lanceolate, acute at each end, deep glossy green on both sides, about half an inch long, and with prominent veins
Cascades willow (*S. cascadenensis* Cockerell)
2. Leaves oval, obtuse at apex, and less than half an inch long; green and shiny above and lighter below; under side of leaves greyish and "powdery," and strongly net-veined. A very dwarfed shrub above timber line *Snow willow* (*S. nivalis* Hook.)
3. Species most characteristic of subalpine zones—from 4,000 to 6,000 feet. 4
3. Species more characteristic of lower elevations—from 2,000 to 5,000 feet. 6
4. Leaves "powdery-like" on under side but not hairy 5
4. Leaves with thin layer of dense, silky, matted hairs on both sides when young (not so characterized on old leaves); green on both sides; margins entire or nearly so. Grows 3 to 9 feet high. Leaves generally oblanceolate in outline, 1½ to 3 inches long. One of most common willows in the Hudsonian Zone
Undergreen willow (*S. commutata* Bebb.)
5. Leaves variable in outline; ovate-lanceolate to obovate, rounded at base and cuspidate at apex; 2 to 4 inches long; hairy above, especially on veins; margin of leaves with numerous rounded teeth to nearly entire. A shrub from 3 to 12 feet tall. Fairly common in Hudsonian meadows *Barclay willow* (*S. barclayi* Anderss.)
5. Leaves lanceolate or ovate-lanceolate, rounded to cordate at base, 2 to 4 inches long, glabrous to "powdery" on under side, and margins slightly toothed. A shrub or small tree 6 to 15 feet tall; not common *Mackenzie willow* (*S. mackenziana* (Hook.) Barratt)
6. Trees with rough, longitudinally furrowed bark on lower trunk; leaves lanceolate and taper-pointed, hairless but appearing as if covered with white powder on under side; upper side dark green
Pacific willow (*S. lasiandra* Benth.)
6. Shrubs or small trees; bark not furrowed; leaves hairy and some times "powdery" beneath; young twigs hairy. 7
7. Catkins appearing before leaves; leaves varying in outline but usually broadly oblanceolate; margin entire or with small, rounded teeth; dull green above and paler below with either a "powdery" appearance or slightly hairy on the under side but never with dense, matted, silky sheen of fine hairs
Scouler willow (*S. scouleriana* Barratt)
7. Catkins appearing with the leaves 8

8. Leaves with dense mat of silky hairs on under side; leaves generally spatulate in outline and 2 to 4 inches long; a tall shrub or small tree common along streams . . . *Sitka willow* (*S. sitchensis* Sanson)
8. Leaves not matted on under side with silky sheen of fine hairs. . . 9
9. Leaves dark green and thinly hairy above; pale, "powdery," and silky below, entire margin rolled back; leaves elliptic-lanceolate to oblanceolate in outline . . . *Geyer willow* (*S. geyeriana* Anderss.)
9. Leaves dark yellow-green on top and hairless, silver-white below with midveins minutely hairy, margin of leaves not rolled back; leaves leathery with yellow stem and midveins
Arroyo willow (*S. lasiolepis* Benth.)

BIRCH FAMILY (BETULACEAE)

This family is represented by two genera in Mount Rainier National Park—the *alders* (*Alnus*) and the *filberts* (*Corylus*). The species represented are either shrubs or trees with alternate leaves which have "saw-toothed" leaf margins. Both staminate and pistillate flowers are borne on the same plant but in separate flower clusters. The two genera may be readily distinguished by their fruit. In the alders, which are quite common in the park, the fruit is cone-like, while in the filbert or hazelnut it is a nut enclosed by a leafy covering.

Red alder (*Alnus rubra* Bong.). This, the most common deciduous tree in the park, may be readily recognized by its light colored ash-grey bark. It is particularly abundant in moist to wet situations, especially along streams, where it often forms dense groves. It reaches a height of from 30 to 60 feet and a diameter of 6 to 18 inches. The leaves are ovate, acutely pointed at the tip, and coarsely toothed, the underside being covered with numerous rusty brown hairs. The upper surface of the leaves is a dull green. The long, pendent, staminate catkins, 5 to 6 inches in length, are a conspicuous feature in the spring and the cone-like pistillate catkins are from half an inch to three-quarters of an inch long or longer than the stalk upon which they are borne.

Sitka alder (*Alnus sinuata* (Regel.) Rydb.). This tall shrub is very common along park streams, particularly at the upper portion of the Canadian Zone, where it often forms dense thickets. It grows from 6 to 12 feet tall and is characterized by dark-colored bark and chestnut-colored twigs. The leaves are ovate, bright, shiny green, coarsely toothed, and not rusty pubescent on the under side. Like the red alder, the long staminate catkins are conspicuous in the spring, but the cone-like pistillate catkins are approximately half the size of those on the red alder, being not more than half an inch long.

California filbert (*Corylus californica* (A. DC.) Rose). This shrub, while native to the park, is not common. It grows to be 6 to 15 feet tall,

has ovate, coarsely toothed leaves, with the nut enclosed in a leafy covering. It is fairly common in certain portions of the Humid Transition Zone, being most readily noticed in Stevens Canyon. Also known locally as hazelnut.

OAK FAMILY (FAGACEAE)

Oregon white oak (*Quercus garryana* Dougl.). During the summer of 1937 one small tree of this species was found just outside the southeastern corner of the park, near where the Ohanapecosh River crosses the south boundary. As yet, this plant has not been collected within the park, but it is very likely that further search will reveal one or two growing in that same area, but within park boundaries. The characters of the oaks are generally well known, and if found in the park this tree will be quickly recognized by its coarsely lobed leaves, which are of leathery texture, and its fruit, which is an acorn. It is quite common on the prairies near Puget Sound.

NETTLE FAMILY (URTICACEAE)

Lyall nettle (*Urtica lyalli* Wats.). This plant, the only species of the nettle family native to the park, is characterized by 4-angled stems and the presence of numerous bristles or stinging hairs which cause severe irritation that may persist for several days. It grows in moist situations and occasionally forms large patches. It is a perennial, with erect simple stems about 3 or 4 feet tall, and opposite leaves 3 to 6 inches long which are broadly ovate and with the margins coarsely toothed. The small greenish flowers are borne in a loose panicle.

MISTLETOE FAMILY (LORANTHACEAE)

Hemlock mistletoe (*Arceuthobium douglasi* Engelm. var. *tsugensis* (Rosendahl) M. E. Jones.). Members of the family Loranthaceae are all parasitic on the branches of woody plants. In the case of the species found in Mount Rainier Park, only the western hemlock, which is a tree of the heavily forested Canadian Zone, is parasitized by this plant which causes the malformations on these trees known as "witches' brooms." It is small, 1 to 5 inches high, olive-yellow throughout, and characterized by opposite, scale-like leaves and 4-angled branches. The fruit is a berry. This species (and others of this genus) is not the mistletoe associated with the romantic tales of the Christmas season.

BIRTHWORT FAMILY (ARISTOLOCHIACEAE)

British Columbia wildginger (*Asarum caudatum* Lindl.). The large kidney-shaped dark green leaves readily identify this plant which is fairly common in the deep woods of the Canadian Zone. The plant is low-

growing, slightly hairy throughout, and has a faint ginger-like odor which accounts for the common name. The flowers are large, bell-like, brownish-purple, solitary, and borne near the ground in leaf axils. There are no petals, but the calyx lobes, which are united at the base, are three in number and oblong-lanceolate in outline.

BUCKWHEAT FAMILY (POLYGONACEAE)

Some of the most common plants of the park are included in this family. Locally the buckwheat family is composed of annual or perennial herbs with simple and generally alternate (sometimes opposite or whorled) leaves. The flowers are small and are borne in a variety of types of inflorescence. A field key to the four native genera follows:

- 1. Flowers grouped in terminal clusters or compact heads and surrounded by a circle of bracts; leaves without stipules .*Eriogonum* (p. 73)
- 1. Flowers not arranged as above; leaves with sheathing stipules. 2
- 2. Leaves kidney-shaped; flowers with 4 sepals. *Oxyria* (p. 74)
- 2. Leaves not kidney-shaped; sepals more than 4 3
- 3. Sepals 6; stigmas brush-like *Rumex* (p. 74)
- 3. Sepals 5; stigmas not brush-like *Polygonum* (p. 74)

Northern eriogonum (*Eriogonum compositum* Dougl.). A tall, handsome plant with a stout, erect, simple stem 8 to 14 inches tall which bears a dense, mostly compound, umbel of white or yellowish flowers. The base of the umbel is characterized by the presence of numerous linear bracts less than half an inch long; branches of the umbel are short and the involucre is thinly covered with fine soft hairs. The leaves are oblong-ovate in outline and heart-shaped at the base with the under side densely white-woolly and the upper side grey-green. Leaves are 1½ to 4 inches long on stems of the same length, or longer, which arise from the base of the main stem so that the leaves appear basal. This plant occurs in rocky to gravelly soils.

Cushion eriogonum (*Eriogonum ovalifolium* Nutt.). A short, much-branched, tufted plant 2 to 8 inches tall that is characteristic of the upper Hudsonian and Arctic-Alpine Zones. The entire plant, except the flowers, is covered with a dense mass of white, woolly hair. Leaves are ovate in outline and quarter of an inch to half an inch long. The yellowish flowers are borne in a dense head-like umbel.

Mountain eriogonum (*Eriogonum coryphaeum*. (T. & G.) G. N. Jones). A very common plant of the Arctic-Alpine and upper Hudsonian Zones. It is rarely more than 2 to 4 inches tall and has rose-colored flowers in dense umbels. The leaves are oblong to obovate in outline, densely matted with woolly, white hairs on the under side and dark green on the upper side,

three-quarters of an inch to 1 inch long, and basal. The entire plant is loosely tufted.

Alpine mountainsorrel (*Oxyria digyna* (L.) Hill). A perennial alpine herb common in the Arctic-Alpine Zone in rocky soils. It has succulent, long-petioled, generally basal, kidney-shaped leaves. Stipules sheath the stems at base. The entire plant is from 4 to 12 inches tall with the flowers, which are green tinged with red, borne in a panicle. The fruit is bright red.

Sheep sorrel (*Rumex acetosella* L.). A perennial weed with creeping rootstocks that is quite common in the park, particularly at the lower elevations along roads and trails where it often forms dense patches. It is from 4 to 18 inches tall with slender, simple, and sometimes branched stems. The alternate, rather narrow leaves (1 to 4 inches long and one-quarter to three-quarters of an inch wide) are characterized by two spreading lobes at the base. The flowers are very small, greenish to red, and borne in either a simple or compound raceme.

American bistort (*Polygonum bistortoides* Pursh.). One of the most common plants of the moist Hudsonian meadows where it is readily recognized by the dense terminal clusters of white flowers upon the erect, simple, jointed, slender stem. This flower cluster upon its slender stem has often been compared in appearance to a bottle brush by many visitors. This plant is perennial, 8 to 18 inches tall, and the leaves are of two types—those that arise from the base of the stem are oblong and pointed at the tip and are 2 to 8 inches long and 1 to 1¼ inches wide; those that occur upon the upper portion of the stem are lanceolate. Also known locally as mountain dock.

Newberry fleecflower (*Polygonum newberryi* Small). A minutely-hairy perennial plant, 4 to 12 inches tall with stout, succulent, flexible stems that, while generally simple, may sometimes be branched. The leaves are a dull yellow-green, ovate to ovate-oblong and tapering to a point at the tip, half an inch to 1½ inches long and have short stems. Sheaths short, brown, entire, and scarious; thin, dry, and not green. The flowers are greenish and in few-flowered spikes, (quarter of an inch to half an inch long) which are axillary in the upper leaves. This plant is characteristic of dry rocky soils of the Hudsonian and lower Arctic-Alpine Zones and is very common in the Yakima Park region. In addition to the foregoing two species, which are the most common in this genus, there are six other species of *Polygonum*, all of which are annuals. *Polygonum convolvulus* L. may be recognized chiefly by its twining or prostrate stem and its leaves which are heart-shaped at the base. *Polygonum aviculare* L. has prostrate stems that are much-branched. This species occasionally forms mats of vegetation. *Polygonum douglasi* Greene has elongated slender spikes of greenish flowers in the leaf axils. *Polygonum kelloggi* Greene bears its flowers in compact, terminal spikes. *Polygonum minimum* Wats. has red stems that are usually much-branched at the base, and *Polygonum lapathifolium* L. has rather large, lanceolate leaves and generally drooping spikes.

GOOSEFOOT FAMILY (CHENOPODIACEAE)

Lambsquarters goosefoot (*Chenopodium album* L.). A rather unattractive weed that has a mealy, greenish appearance throughout. The stems are stout, erect, and from 1 to 3 feet tall. The leaves are triangular in outline, alternate, half an inch to 1½ inches long, with wavy or dentate margins, green on the upper side and a lighter mealy green color on the under side. The leaves near the top of the stem, however, are almost lanceolate in outline and do not have wavy or dentate margins. The flowers are small, green, and borne in compact spikes that are terminal on the stem or in the axils of the leaves.

PURSLANE FAMILY (PORTULACACEAE)

Nine species of this family (included in three genera—*Claytonia*, *Lewisia*, and *Spraguea*), are native to Mount Rainier National Park and several of them are common in this region. In general, all are succulent or fleshy plants having entire leaves and white, pink, or purple flowers. Petals of the flowers are thin and delicate; sepals are two in number.

Miners lettuce (*Claytonia asarifolia* Bong.). A succulent perennial with simple stems arising in a loose tuft from the rootstock. The stems are 6 to 12 inches tall and have a single pair of sessile, broadly-ovate, opposite leaves just below the flower cluster. Leaves arising from the rootstock, however, are long-stemmed, broadly ovate, somewhat obtuse, and from half of an inch to 1½ inches long. Found in moist situations along streams in the upper Canadian and Hudsonian Zones.

Springbeauty (*Claytonia siberica* L.). A very common succulent plant in moist places up to about 5,000 feet. The simple stems, 6 to 15 inches tall, arise from a mass of fibrous roots in a loose tuft. The leaves that arise from the base of the tuft are ovate, acute, and contracted at the base into long, margined stems. The leaves on the stem are ovate and sessile with but one pair of opposite leaves per stem. The flowers are white to pinkish, veined with red, and borne on long pedicels in a loose, open raceme.

Lanceleaf springbeauty (*Claytonia lanceolata* Pursh.). The succulent, simple stems arise from a tuber in an open tuft 6 to 12 inches tall. Leaves arising from the base of the tuft are few in number (or none), long-stemmed, lanceolate, and acute. A pair of opposite lanceolate to ovate-lanceolate leaves are borne upon each stem. The flowers are pink.

Linearleaved springbeauty (*Claytonia linearis* Dougl.). A succulent annual with alternate leaves three-quarters of an inch to 4 inches long. The stem leaves are numerous. The flowers are in a somewhat 1-sided raceme. Not common.

Littleleaf springbeauty (*Claytonia parvifolia* Mac.). The entire plant is pinkish. It is a perennial, and the stems are much-branched from the

base. The stem leaves are numerous and alternate, quarter of an inch to three-quarters of an inch long, with the lower ones with short stems. The flowers are pink and in racemes. Frequent in moist locations.

Columbia lewisia (*Lewisia columbiana* (Howell) Robinson). The genus to which this plant belongs was named in honor of Capt. Meriwether Lewis of Lewis and Clark fame. This species is a fairly common plant of the Hudsonian Zone. The leaves are in a dense basal tuft, green, oblanceolate to spatulate, fleshy but flat, and half an inch to 2 inches long. The flower stems are erect and from 4 to 12 inches tall with oblong, pinkish bracts. The attractive pink to rose-red flowers are numerous and borne in a loose panicle. Two other species—*L. triphylla* (Wats.) Robinson and *L. exarticulata* St. John—grow in the park, but they are not common.

Mount Hood pussypaws (*Spraguea candicifera*). This is a very common plant of rocky or pumice soils at elevations of from 6,000 to 9,000 feet. The thick spatulate green leaves are densely crowded upon very short branches at the crown of the thick, fleshy root and appear to be in a dense tuft at the base of the spreading flower stems which are 1 to 1½ inches long and pink in color. The flowers are cream colored to rose-purple and clustered in dense heads.

PINK FAMILY (CARYOPHYLLACEAE)

Plants of this family are characterized by opposite (whorled in *Spergula*), entire leaves and stems that are usually swollen at the joints. The cultivated pinks and carnations belong to this family. A field key to the eight genera native to this park follows:

1. Sepals united 2
2. Sepals free to the base or nearly so 3
2. Calyx cylindrical. *Sweetwilliam* (*Dianthus barbatus*) (p. 77)
2. Calyx tubular or bell-like *Silene* (*Silene* spp.) (p. 77)
3. Stipules present 8
3. Stipules absent 4
4. Petals absent. *Pearlwort* (*Sagina* spp.) (p. 77)
4. Petals present 5
5. Petals deeply notched or parted 6
5. Petals entire or else only slightly notched 7
6. Flowers in terminal, bracted, forked cymes
Cerastium (*Cerastium* spp.) (p. 77)
6. Flowers solitary or in simple cymes . . . *Starwort* (*Stellaria* spp.) (p. 78)
7. Leaves awl-shaped or thread-like; plants small matted herbs. . .
Pearlwort (*Sagina* spp.) (p. 77)

7. Leaves sessile, often subulate and more or less rigid; plants not matted. *Sandwort* (*Arenaria* spp.) (p. 78)
8. Leaves linear, flat and opposite
Red sandspurrey (*Spergularia rubra*) (p. 78)
8. Leaves subulate and whorled *Spurrey* (*Spergula arvensis*) (p. 78)

Sweetwilliam (*Dianthus barbatus* L.). Probably introduced from gardens in the vicinity of Longmire. Flowers several to many, red or white, in a compact cyme, the petals toothed and bearded. The stems of this plant are 4-angled, simple or branched, and 10 to 20 inches tall. The leaves are rather large and lanceolate.

Suksdorf silene (*Silene suksdorfii* Robinson). A plant of rocky soils at about 6,000 feet elevation. It is tufted and about 2 to 6 inches tall with linear to spatulate leaves from quarter of an inch to half an inch long and with flowers borne singly or in 2's or 3's. The petals of the flowers are white, united in a tubular ball-like form, and notched at the apex. The calyx, also united, is characterized by conspicuous narrow, dark stripes (nerves).

Moss silene (*Silene aculis* L., var. *exscapa* (Ail) DC). A densely tufted moss-like plant of the Arctic-Alpine Zone; quite common on Burroughs Mountain. It rarely grows taller than 2 inches and has numerous linear leaves not much more than quarter of an inch long. The small flowers are reddish-purple, with the petals united and bell-shaped. Known locally as moss campion.

Catchfly (*Silene douglasi* Hook.). Quite common on open sunny hill-sides in the Hudsonian Zone. The slender stems are erect and from 10 to 20 inches tall with narrow lanceolate to oblanceolate leaves 1 to 2 inches long. The flowers are in few-flowered cymes. The petals of the flowers are united into a bell-like form, are white to pinkish, and are 2-lobed. Calyx also united, greenish, and marked with fine dark lines (veins). *Silene macouni* Wats. is similar to *S. douglasi* but the petals are 4-lobed. *Silene menziesii* Hook. has weak, erect, or decumbent stems that are generally branched and with small flowers solitary in the forks of the leafy branches. *Silene noctiflora* L. has stout, erect stems 6 to 36 inches tall with oblanceolate or spatulate lower leaves and lanceolate upper leaves and long-stemmed white flowers in a loose cyme.

Pearlwort (*Sagina* spp.). These plants, of which there are two species native to the park, are small matted herbs with thread-like leaves and small flowers at the tips of the stem and branches. They are not common or showy and therefore are not described more fully here. *Sagina linnaei* Presl. is an alpine plant, while *Sagina occidentalis* Wats. is characteristic of moist soils at the lower elevations.

Cerastium (*Cerastium* spp.). The local common name of these plants, mouse-ear chickweed, of which there are two species native to Mount

Rainier National Park, is derived from the downiness of the thin leaves, supposedly having a soft "furry" appearance like a mouse's ear. This and the larger flowers distinguish this genus from the starworts or true chickweeds (*Stellaria*). The leaves are flat and, as stated, downy-pubescent, and the flowers are in terminal cymes and white. In *Cerastium arvense* L. the petals are decidedly longer than the sepals, while in *Cerastium vulgatum* E. var. *hirsutum* Fries. the petals are not longer than the sepals.

Starwort (*Stellaria* spp.). Eight starworts or chickweeds are native to the park. All are small plants with white, star-like blossoms borne singly or in cymes. They are not showy, thus are rarely noticed by the average visitor and consequently are not described more fully here. Starworts native to the park are *Stellaria borealis* Bigel., *S. borealis* Bigel. var. *bongardiana* Fernald, *S. borealis* Bigel. var. *isophylla* Fernald, *S. borealis* Bigel. var. *simcoeii* (Howell) Fernald, *S. caycantha* (Lebed.) Rydb., *S. crispa* Cham. & Schlecht, *S. nitens* Nutt., and *S. washingtoniana* Robinson.

Sandwort (*Arenaria* spp.). Six species of sandworts are found in Mount Rainier National Park. All may be generally characterized as perennial, tufted and often matted herbs having linear or needlelike leaves and white flowers borne in cymes. *Arenaria verna* L., var. *propinqua* (Rich.) Fernald is the most common of the six native species. It is found in rocky soils in the Hudsonian and lower Arctic-Alpine Zones. It is 2 to 6 inches tall, tufted, with linear to awl-shaped flat leaves that are strongly marked with the prominent nerves. The leaves are about quarter of an inch long and are largely grouped at the base of the flower stems. *Arenaria formosa* Fisch. is from 4 to 7 inches tall, tufted, and with grass-like, mostly basal leaves. The petals of the white flowers are much longer than the sepals. *Arenaria macrophylla* Hook. has generally simple stems 2 to 6 inches tall with lanceolate leaves about half an inch to 1½ inches long that are acute at each end. The cymes are characterized by but few flowers. This species is quite common in the moist woods of the Canadian Zone. *Arenaria laricifolia* L. is characteristic of the rocky soils of the Hudsonian and lower Arctic-Alpine Zones. It is from 2 to 6 inches tall and grows in dense mats. *Arenaria nuttalli* Pax. is a leafy perennial, densely branched from the stout root. The leaves are linear to awl-shaped and the flowers are numerous. *Arenaria serpyllifolia* L., unlike the other species mentioned, is an annual. The plant is leafy, with ovate leaves that are tipped with a fine point at the apex, are sessile and about quarter of an inch long. It is a plant of dry soils at varying altitudes.

Red sandspurrey (*Spergularia rubra* J. & C. Presl.). A small, comparatively rare plant of dry soils. It has tiny deep pink flowers and flat, linear leaves.

Corn spurrey (*Spergula arvensis* L.). An annual weed. It has prostrate stems from 6 to 12 inches long with whorled, threadlike leaves from half an inch to 2 inches long. The white flowers are in loose cymes.

WATERLILY FAMILY (NYMPHAEACEAE)

Rocky Mountain cowlily (*Nuphar polysepalum* Engelm.). Also called spadderdock. As this is the only species belonging to the waterlily family native to the park it can be readily identified by everyone from the nature of its habitat. It is found in many ponds and lakes up to about 4,500 feet. It is a perennial with thick rootstocks, long petioled floating leaves, and bright yellow flowers. The leaves are nearly circular or broadly oval in outline, 7 to 12 inches long and 6 to 8 inches wide, and deeply heart-shaped at the base. The flower is interesting because the calyx rather than the corolla is the showy portion. The calyx is almost globose, a bright golden-yellow, and about 3 inches wide. The petals, on the other hand, are small, thick, and stamen-like.

BUTTERCUP FAMILY (RANUNCULACEAE)

This is a large and important family which includes some of the most beautiful wild flowers of the park. While the various species exhibit a great variety of form and appearance, the family is characterized by having the stamens, sepals, and petals (when petals are present) inserted below the pistils. A field key to the nine genera native to Mount Rainier National Park follows:

- | | |
|---|--|
| 1. Leaves alternate | 2 |
| 1. Leaves basal or whorled, finely divided . <i>Anemone</i> (<i>Anemone</i> spp.) (p. 80) | |
| 2. Flowers in racemes, blue or white | 3 |
| 2. Flowers not in racemes | 5 |
| 3. Petals white; flowers not spurred or with hood; fruit a bright red berry | <i>Western baneberry</i> (<i>Actaea arguta</i>) (p. 80) |
| 3. Petals blue, with spur or hood | 4 |
| 4. Upper sepal spurred; with 4 petals. . <i>Larkspur</i> (<i>Delphinium</i> spp.) (p. 81) | |
| 4. Upper sepal hood-like; with 2 petals | |
| | <i>Columbia monkshood</i> (<i>Aconitum columbianum</i>) (p. 81) |
| 5. Flowers with spurs, red; leaves 1- to 3-compound. | |
| | <i>Sitka columbine</i> (<i>Aquilegia formosa</i>) (p. 81) |
| 5. Flowers not spurred | 6 |
| 6. Petals absent; stamens very numerous so that flower has a "bristly" appearance | 7 |
| 6. Petals present | 8 |
| 7. Leaves simple and palmately lobed. | |
| | <i>False bugbane</i> (<i>Trautvetteria grandis</i>) (p. 81) |
| 7. Leaves decom pound in 3's | |
| | <i>Western meadowrue</i> (<i>Thalictrum occidentale</i>) (p. 81) |

8. Flowers white; leaves mostly basal, simple, broad heart-shaped, and with margins of rounded teeth
Elkslip marshmarigold (*Caltha leptosepala*) (p. 82)
8. Flowers yellow or, if aquatic, white; leaves deeply cleft, dissected, or lobed *Buttercup* (*Ranunculus* spp.) (p. 82)

Three-leaf anemone (*Anemone deltoidea* Hook.) A common and very attractive plant of the deep woods, blooming in late spring and early summer. The single white blossom, about 1½ inches in diameter, is borne at the apex of the slender stem. The anemones lack petals; the white so-called "petals" in this case are, in reality, sepals. A whorl of three leaves is borne about midway upon the slender stem, the leaves being 1 to 3 inches long, ovate in outline, acute, and with edges cut rather deeply into numerous teeth or lobes.

Drummond anemone (*Anemone drummondi* Wats.). A rather uncommon anemone found in rocky crevices of the upper Hudsonian and Arctic-Alpine Zones. This plant is 2 to 6 inches tall, with several long-stemmed, finely divided, compound leaves arising from the rootstock. Leaf segments are narrowly wedge-shaped. The flowers, lacking petals, have creamy-white sepals washed with a faint bluish tinge.

Lyall anemone (*Anemone lyalli* Britt.). A rare plant of the moist woods, with slender stems 2 to 4 inches tall, small white flowers, and three foliate leaves, the leaflets lanceolate to ovate and obtusely toothed.

Western pasqueflower (*Anemone occidentalis* Wats.). Also known as western anemone. This is one of the most common plants of the Hudsonian meadows, blooming shortly after the ground is free of snow. In the late summer and early fall these meadows are characterized by the numerous fuzzy seed heads of these plants. The entire plant is characterized by the presence of numerous long hairs. The stems are stout and from 3 to 18 inches tall. The three leaves upon the stem are arranged in a whorl, are sessile upon the stem, and are finely divided into numerous narrow segments. The flowers, borne singly at the apex of the stem, are 2 to 2½ inches in diameter, and have white sepals lightly tinged with purple. The flowers bloom late in June and early in July, at which time the stems are short. As the season advances the stems continue to grow and elongate until they are 12 to 18 inches tall and bear the characteristic seed clusters. The seeds are akenes, each having a long silk-like strand, giving the seed cluster its "fuzzy" appearance, not unlike a small dish mop.

Hudsonian anemone (*Anemone hudsoniana* (DC.) Richards). This rare plant, found principally in rocky locations, is silky-hairy throughout, with leaves in threes and cleft into linear divisions. The flowers, one to three in number, are yellowish, sometimes washed with a bluish tinge.

Western baneberry (*Actaea arguta* Nutt.). A frequent plant in moist to wet soils in the forests of the lower elevations. It is erect and 12 to 24

inches tall; leaves are compounded three times with the leaflets being ovate to lanceolate in outline and with their margins characterized by numerous deeply cut teeth. The white flowers are borne in dense compact racemes at first, later becoming more open. The berries are a bright red.

Tallmountain larkspur (*Delphinium scopulorum*). An erect, succulent plant from 3 to 6 feet tall, with stout smooth stems which often appear glaucous (powdery, like the bloom on a plum). The leaves are rather large, about 4 to 8 inches wide and 3 to 6 inches long, nearly circular in general outline, and parted into five to seven lobes which are margined with large teeth. The leaves are a dark green on the upper side and lighter below. The flowers are dark blue, in a dense raceme, the individual flowers borne upon rather short stems about half an inch to three-quarters of an inch long. This plant is often found in moist situations in open woods between 2,000 and 4,000 feet.

Little larkspur (*Delphinium glareosum* Greene). This plant grows to a height of from 4 to 12 inches. It is occasionally found in moist situations at about 5,000 feet in elevation. The leaves, 1 to 2 inches long and 1½ to 3 inches wide, are nearly circular in general outline. They are deeply cleft into five parts, each part being deeply lobed. The raceme may be few- to many-flowered. Flowers are a deep purple-blue and borne upon long stems. The pods are veined with blue.

Columbia monkshood (*Aconitum columbianum* Nutt.). This flower has five sepals, the common name being derived from the shape of the upper sepal which is in the form of a hood. It is a plant of moist situations of the upper Canadian and lower Hudsonian Zones. The tall, slender stems reach a height of from 1½ to 4 feet. The upper portion of these stems is covered with fine, short hairs. The leaves are borne on short stems and are palmately divided into several parts, each part, in turn, being deeply lobed. The flowers are very showy, a deep blue and borne in racemes.

Sitka columbine (*Aquilegia formosa* Fisch.). A very attractive and fairly common plant of the Hudsonian Zone in moist well-drained soils. It is an erect plant, 2 to 3 feet tall, with many branched stems. The attractive red flowers with yellow centers are borne at the ends of the nodding branches. There are five petal-like sepals and five petals, each petal with a long hollow spur extended backward. The leaves are 1- to 3-compound.

False bugbane (*Trautvetteria grandis* Nutt.). A tall, erect perennial that is fairly common in very moist places in open woods up to 5,000 feet in elevation. The leaves are palmately lobed into five to nine parts, the edges of the lobes being deeply toothed; leaves 2 to 6 inches wide and wider than long. One leaf arising from the root has a long stem; leaves upon the main stem are short-stemmed. Flowers are white and in corymbs. The numerous stamens and pistils give the flower a "bristly" appearance.

Western meadowrue (*Thalictrum occidentale* Gray). An erect peren-

nial 15 to 36 inches tall, with slender stems. The leaves are compounded several times in threes with the leaflets round, oblong, or orbicular in outline, the margin at the apex notched. Each leaflet has a short, slender stem. The flowers are greenish-white and borne in a loose panicle, the petal-like sepals being a dull greenish color. The numerous stamens give the flower a "bristly" appearance. This plant prefers moist soils at about 5,000 feet in elevation.

Elkslip marshmarigold (*Caltha leptosepala* D. C.). A common and very attractive plant of moist to wet locations in the Hudsonian Zone. It is particularly abundant in early summer in places where water from melting snowbanks accumulates. It is a low, succulent plant, 3 to 7 inches tall, with heart-shaped leaves upon succulent stems; leaf margins with numerous rounded teeth. The flowers are white with 7 to 10 oblong petal-like sepals often with a bluish tinge beneath.

Mountain buttercup (*Ranunculus eschscholtzi* Schlecht.). A very common and attractive little plant of moist situations in the Hudsonian meadows early in the summer. The petals are a bright glossy yellow and appear as if varnished. The entire flower is about three-quarters of an inch across. The sepals are small and greenish-yellow. The basal leaves are round in outline, deeply cleft into several parts and with the upper margin of each part deeply toothed; the upper leaves are oblanceolate and deeply notched.

Bongard buttercup (*Ranunculus bongardi* Greene). This plant is from 12 to 20 inches tall and has deeply cleft leaves and small yellow flowers in cymes.

Watercrowfoot buttercup (*Ranunculus aquatilis* L.). An aquatic plant with small white flowers and two types of leaves—floating and submerged. The former are round or kidney-shaped in outline with margins lobed or parted and the latter are threadlike.

BARBERRY FAMILY (BERBERIDACEAE)

Deerfoot vanillaleaf (*Achlys triphylla* (Smith) DC.). This is a very common plant of the deep coniferous forests where it often forms large patches. It grows to a height of from 1 to 2 feet. The slender erect flowers and leaf stems arise separately from creeping rootstocks. The leaves are compound with three spreading fan-shaped leaflets whose outer margin is coarsely wavy. The small white flowers are borne at the top of the slender flower stalk in a compact spike. The usual common name is derived from the peculiar vanillalike odor of the leaves after drying and this also accounts for another common name—sweet-after-death.

Barrenwort (*Vancouveria hexandra* (Hook.) Morr. & Deene). An uncommon plant at low elevations. It is about 12 to 18 inches tall, with leaves compounded three times. Leaflets are 3-lobed and about three-quarters of an inch to 2 inches long and 1 inch wide. The small white flowers are borne in racemes or panicles.



Figure 56.—CASCADES MAHONIA (*Mahonia nervosa*).

Figure 57.—STONECROP (*Sedum divergens*). Asahel Curtis Photo.





Figure 58.—TOLMIE SAXIFRAGE (*Saxifraga tolmiei*).



Figure 59.—ALASKA SPIREA (*Luetkea pectinata*).

Figure 60.—WESTERN THIMBLEBERRY (*Rubus parviflorus*).





Figure 61.—SUBALPINE SPIREA (*Spiraea densiflora*). Lindsley Photo.





Figure 63.—WESTERN MOUNTAINASH (*Sorbus occidentalis*).

Figure 64.—SUBALPINE LUPINE (*Lupinus subalpinus*).



← Figure 62.—FANLEAF CINQUEFOIL (*Potentilla flabellifolia*). Lindsley Photo.



Figure 65.—FOLIAGE AND FRUIT OF BIGLEAF MAPLE (*Acer macrophyllum*). BACKGROUND RULED IN INCH SQUARES.

Figure 66.—FLOWERS AND NEW FOLIAGE OF BIGLEAF MAPLE (*Acer macrophyllum*). BACKGROUND RULED IN INCH SQUARES.

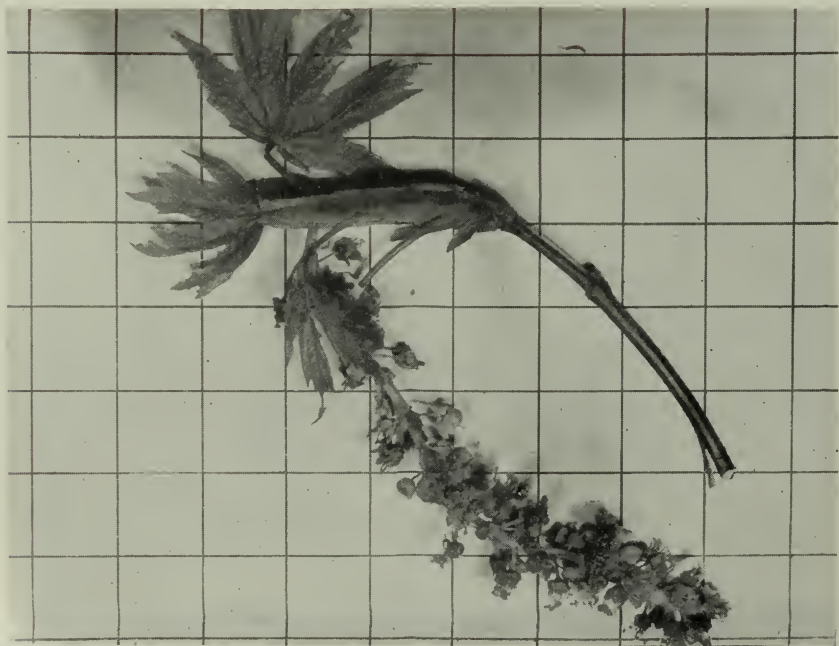




Figure 67.—PIONEER VIOLET (*Viola glabella*).

Figure 68.—FIREWEED (*Epilobium angustifolium*). Victor Scheffer Photo.



Figure 69.—DEVILSCLUB (*Oplopanax horridus*).





Figure 70.—BUNCHBERRY DOGWOOD (*Cornus canadensis*).

Cascades mabonia (*Mahonia nervosa*). A common plant in the woods of the lower elevations, having compound leaves 8 to 16 inches long; leaflets oblong in outline and characterized by spiny "teeth" which give the plant a distinctive "hollylike" appearance, accounting for the local name of oregongrape. The numerous yellow flowers are borne in racemes. The fruit is a deep blue-black, fleshy berry. Another species—*Mahonia aquifolium* Pursh.—is not so common. It is similar except for its larger size; it grows to be 3 to 4 feet tall. Its berries are often pear-shaped.

FUMITORY FAMILY (FUMARIACEAE)

Scouler corydalis (*Corydalis scouleri* Hook.). A very common plant of moist places in the deep woods at the lower elevations. It grows to a height of 3 to 4 feet and often forms compact patches. It is a succulent plant with large pinnately decomposed leaves, the segments rounded and sometimes lobed. The 1-spurred pink flowers are borne in a terminal raceme.

Pacific bleedingheart (*Dicentra formosa* (Andr.) DC.). An uncommon plant of moist locations in the deep woods. The leaves are 2- to 3-compound with the segments deeply cut into narrow lobes. The reddish, heart-shaped flowers, which account for the common name of this plant, are in panicles and have two spurs.

MUSTARD FAMILY (CRUCIFERAE)

This family is characterized by plants having alternate leaves and flowers with four petals and sepals which, because their arrangement is somewhat in the form of a cross, accounts for the family name—Cruciferae. The fruit is a pod of varying shape and size but upon maturity, in most cases at least, the sides of the pod open up to expose a central partition upon both sides of which the seeds are attached. Many of the species of this family are also characterized by pungent juice.

- 1. Leaves not lobed; entire or toothed 2
- 1. Leaves, at least lower ones, deeply lobed or divided 5
- 2. Pods conspicuously flattened 3
- 2. Pods not flattened, but linear and many times longer than thick
 - Necklace erysimum* (*Erysimum torulosum*) (p. 92)
- 3. Pods notched at upper end with a wing about the edge
 - Pennycress* (*Thlaspi* spp.) (p. 92)
- 3. Pods not as above. 4
- 4. Pods short, rounded to linear-oblong; flowers white or yellow
 - Draba* (*Draba* spp.) (p. 92)
- 4. Pods long, linear; flowers white, pink, or purple
 - Rockcress* (*Arabis* spp.) (p. 93)

5. Pods about as long as broad and flattened 6
5. Pods decidedly longer than broad (if short then not flattened). 7
6. Pods 3-cornered *Shepherdspurse* (*Capsella bursa-pastoris*) (p. 93)
6. Pods rounded *Field pepperweed* (*Lepidium campestre*) (p. 93)
7. Flowers white 8
7. Flowers yellow or pink to purple 10
8. Plants densely and finely covered with white hairs; pods lanceolate *Smelowskia* (*Smelowskia* spp.) (p. 93)
8. Plants green and only slightly hairy if at all; pods linear 9
9. Sides of pods recurving as they become ripe; plants of wet soil
Bittercress (*Cardamine* spp.) (p. 94)
9. Sides of ripe pods remaining straight upon opening; plants of dry soils *Rockcress* (*Arabis* spp.) (p. 93)
10. Flowers yellow 11
10. Flowers pink to rose-purple *Oregon toothwort* (*Dentaria tenella*) (p. 94)
11. Pods long 12
11. Pods short and linear-oblong in outline
Yellowcress (*Rorippa curvisiliqua*) (p. 94)
12. Herbage glabrous *Erectpod wintercress* (*Barbarea orthoceras*) (p. 94)
12. Herbage more or less pubescent. *Sisymbrium* (*Sisymbrium* spp.) (p. 94)

Necklace erysimum (*Erysimum torulosum* Piper). A plant of dry rocky locations of the upper Hudsonian and lower Arctic-Alpine Zones; can be readily recognized by the dense raceme of bright yellow flowers. It is from 4 to 12 inches tall, with a stout, erect stem covered with short grey hairs. The leaves are narrow, linear to spatulate, and toothed. The seed pod is linear and somewhat 4-angled. Also commonly known as mountain wallflower.

Blue pennycress (*Thlaspi glaucum* A. Nels.). This perennial is found in rocky soils between 5,000 and 7,000 feet. It is a tufted plant with slender stems, 4 to 12 inches tall, upon which are racemes of small white flowers. The leaves are mostly basal, in which case they are obcordate in outline and slightly toothed and tapering to a slender petiole at the base. The stem leaves are linear in outline, sessile, and have two earlike lobes at the base. The seed pods are obovate in outline, quarter of an inch or less long, upon slender stems.

Field pennycress (*Thlaspi arvense* L.). An annual weed plant of waste places at lower elevations, such as along roadsides. The plant is larger, the seed pods are larger and winged—otherwise this species closely resembles the above.

Willow grass (*Draba aureola* Wats.). A plant of high elevations—from 6,000 to 9,000 feet—growing in the loose pumice or rocky soils. It is not

more than 6 inches tall and is densely leafy with a compact raceme of yellow flowers. Basal leaves are oblanceolate, entire, obtuse, and about half an inch long. The fact that they are somewhat like the leaves of a willow in appearance accounts for the common name of this plant. The entire plant is covered with short white hairs. The seed pods are quarter of an inch to half an inch long and oblong in outline.

Draba (*Draba oligosperma* Hook.). A diminutive, densely tufted perennial with small linear leaves (not more than quarter of an inch long) crowded at the base of the several flower stems arising from the tuft. Flower stems are slender, about 2 inches tall, and bear small pale yellow flowers. This plant grows in dry rocky soils at elevations of from 8,000 to 10,000 feet. Another species (*Draba lochocarpa* Rydb.) has white flowers. It is a slender, tufted plant of rocky situations from 5,000 to 6,500 feet in elevation.

Rockcress (*Arabis* spp.). This group of plants, of which there are six species in the park, may be generally characterized by their erect form with mostly basal leaves. Stem leaves are sessile, clasping, and possessed of two ear-like lobes at the base. All leaves are simple and seldom divided. The flowers are white to purple and the pods are long and linear. Various members of this group are found at different altitudes, but the two most common species are characteristic of the Hudsonian and lower Arctic-Alpine Zones. *Arabis drummondi* Gray is from 12 to 30 inches tall with lanceolate, clasping stem leaves and spatulate basal leaves. The seed pods are 2 to 2½ inches long, linear and erect; seeds are winged. This plant may be found in the park from 3,000 to 5,000 feet. *Arabis lyalli* Wats. is from 2 to 6 inches tall and has deep purple flowers. It is characteristic of the Hudsonian Zone. The other four species—*Arabis patula* Graham, *A. furcata* Wats., *A. glabra* (L.) Bernh., and *A. hirsuta* (L.) Scop.—will not be generally encountered by the average park visitor and therefore are not described here.

Shepherdspurse (*Capsella bursa-pastoris* (L.) Medic.). This is a weed plant common in waste places such as in poor soils bordering highways. It is from 12 to 24 inches tall, loosely tufted with several slender stems bearing loose racemes of small white flowers. The basal leaves are in a rosette and are lanceolate to oblanceolate in outline and toothed. The stem leaves are lanceolate to spatulate in outline and sessile. The seed pods are triangular, with long stems, and with a notch at the apex.

Field pepperweed (*Lepidium campestre* L.). An erect plant, 12 to 20 inches tall, with several erect branches bearing loose racemes of small white flowers. The stems are leafy. The leaves are broadly linear to oblong in outline, edges slightly toothed, sessile, and with base of each leaf having two conspicuous ear-like lobes. The seed pods are ovate in outline.

Smelowskia (*Smelowskia ovalis* Jones.). One of the common plants of dry rocky situations at high elevations—from 6,000 to 9,000 feet. It can

be readily recognized by the tufted, matted habit, the finely divided grey-green leaves, and small white flowers which are borne in racemes. It grows to a height of 2 to 6 inches from a stout root.

Dwarf smelowskia (*Smelowskia calycina* C. A. Mey.) is similar to the above in most respects, but is much smaller. It is characteristic of the Arctic-Alpine Zone from 6,000 to 10,000 feet in elevation.

Bittercress (*Cardamine* spp.). These are succulent perennials which are characteristic of shaded moist to wet situations. They have erect stems bearing small white flowers in a raceme. The leaves may be entire, but are generally lobed or divided. Seven species are native to the park. None of these may be regarded as very common. In the case of *Cardamine bellidifolia* L., the leaves are all simple and entire. *Cardamine breweri* Wats. has only the basal leaves simple; the others are divided into 3 to 5 leaflets. *Cardamine angulata* Hook. has all leaves 3-foliate (with three leaflets), the margin of each leaflet being characterized by three to five coarse teeth. *Cardamine oligosperma* Nutt., *Cardamine pennsylvanica* Muhl., *Cardamine kamtschatica* (Regel.) Schulz and *Cardamine occidentalis* (Wats.) Howell all have leaves divided into from 3 to 13 leaflets but differ in minor botanical respects. These latter species are not common and, therefore, are not fully described.

Oregon toothwort (*Dentaria tenella* Pursh.). An uncommon plant of the moist, shaded woods. It is from 4 to 14 inches tall, with a raceme of rose-purple flowers.

Yellowcress (*Rorippa curvisiliqua* (Hook.) Bessey). A rather tall weedy plant with much-branched stems, yellow flowers, and pinnately lobed leaves. Not common.

Erectpod wintercress (*Barbarea orthoceras* Ledeb.). A succulent perennial having angled stems and yellow flowers.

Sisymbrium (*Sisymbrium* spp.). Much-branched weed plants of poor dry soils. They are slightly hairy, with finely dissected leaves and yellow flowers. There are two native species—*Sisymbrium officinale* (L.) Scop., and *Sisymbrium altissimum* L.—neither of which is apt to attract the attention of the average visitor.

SUNDEW FAMILY (DROSERACEAE)

Roundleaf sundew (*Drosera rotundifolia* L.). This species is the local representative of a small but very interesting family of insectivorous plants. It is found in boggy soils, such as in the Longmire swamp where it is quite common. The leaves, in a rosette upon the boggy soil, are round in outline but narrowed abruptly at the base to form a long stem. The leaf margins are characterized by the presence of numerous sensitive, sticky, glandular hairs which serve to entrap small insects. The small white flowers are borne in a loose raceme. The fruit is an oblong capsule.

STONECROP FAMILY (CRASSULACEAE)

Stonecrop (*Sedum divergens* Wats.). This common plant, generally found upon rocks, may be readily recognized by its succulent, fleshy appearance, also by its bright yellow flowers which are borne in a compact cyme. The leaves are very thick, fleshy, oval in outline, sessile and about quarter of an inch long. A second species, *Sedum oreganum* Nutt., has flattened leaves, and a third species, *Sedum integrifolium* (Raff.) A. Nels., grows in the Hudsonian Zone and has reddish-purple flowers. The latter two plants are rather rare in the park.

SAXIFRAGE FAMILY (SAXIFRAGACEAE)

In Mount Rainier National Park this family is well represented by many common plants. It is also of significance inasmuch as the genus *Ribes* (currants and gooseberries) is the alternate host for the white pine blister rust which has done considerable damage to the white pine in the park. The various members of the family vary greatly in their characters but in most cases each species will have a 5-lobed calyx, 5 petals, and either 5 or 10 stamens.

1. Herbs 2
1. Shrubs 14
2. Flowers solitary 3
2. Flowers not solitary 5
3. Flowers solitary and in axils of leaves
Goldensaxifrage (*Chrysosplenium glechomaefolium*) (p. 96)
3. Flowers not in leaf axils 4
4. Flower large and conspicuous, about half an inch to three-quarters of an inch in diameter, at the apex of a long, slender, naked (sometimes with a single bract) stem; stamens 5
Rockymountain parnassia (*Parnassia fimbriata*) (p. 96)
4. Flower smaller; flower stem shorter; stamens 10
Saxifrage (*Saxifraga* spp.) (p. 96)
5. Inflorescence a raceme 6
5. Inflorescence not a raceme 9
6. Raceme 1-sided; flowers bell-shaped; plant lightly covered with minute hairs *Alaska fringe-cup* (*Tellima grandiflora*) (p. 98)
6. Raceme not 1-sided 7
7. Flower elongated, funnel-shaped
Menzies tolmiea (*Tolmiea menziesi*) (p. 98)
7. Flower not elongated 8
8. Flowers disk-like, small; petals divided into numerous hairy filaments *Miterwort or Bishopscap* (*Mitella* spp.) (p. 98)

8. Flowers not disk-like but small, with the calyx campanulate;
petals distinct, white, and not divided into hairy filaments
Foamflower (*Tiarella* spp.) (p. 99)
9. Inflorescence a panicle. 10
9. Flowers in cymes or cymose panicles . *Saxifrage* (*Saxifraga* spp.) (p. 96)
10. Leaves leathery in texture, oblong to obovate, and coarsely serrate *Leptarrhena* (*Leptarrhena amplexifolia*) (p. 99)
10. Leaves not leathery, long-petioled, rounded in outline, and heart-shaped at the base 11
11. Ten stamens present *Foamflower* (*Tiarella* spp.) (p. 99)
11. Five stamens present 12
12. Rootstocks with bulblets . . *Suksdorfia* (*Suksdorfia ranunculifolia*) (p. 99)
12. Rootstocks without bulblets. 13
13. Flowers borne on naked (leafless) stalks
Alumroot (*Heuchera* spp.) (p. 99)
13. Flowers borne upon leafy shoots
Santa Lucia boykinia (*Boykinia elata*) (p. 99)
14. Leaves alternate. . . . *Currants and Gooseberries* (*Ribes* spp.) (p. 100)
14. Leaves opposite *Mockorange* (*Philadelphus lewisii*) (p. 99)

Goldensaxifrage (*Chrysosplenium glechomaefolium* Nutt.). This is a small perennial with small succulent leaves. It grows in moist places at lower elevations. The stem is sometimes creeping and rooting at the joints or nodes, with ascending flower-bearing branches 2 to 4 inches high. The flowers are small and inconspicuous, have no petals, and are borne solitary in the leaf axils. The leaves are short petioled, almost round (quarter of an inch to three-quarters of an inch wide) and with wavy margins. Upon flower-bearing branches the leaves are alternate and on nonflower-bearing branches they are opposite.

Rockymountain parnassia (*Parnassia fimbriata* Koenig). This is a fairly common succulent plant found in moist to wet locations, generally along small streams, in the Hudsonian Zone. The rather attractive flowers, half an inch to three-quarters of an inch in diameter, are white, veined with yellow or light green, and are borne at the top of a slender, erect succulent stalk from 6 to 12 inches tall. The flower-bearing stem is naked with the exception of a single scale-like leaf which is sometimes present. The succulent leaves are kidney shaped, are about 1 to 1½ inches broad, and are in a cluster at the base of the flower stalk. Also commonly known as grass of Parnassus.

Tolmie saxifrage (*Saxifraga tolmiei* T & G). A very common and attractive plant characteristic of rather barren locations in the Hudsonian and lower Arctic-Alpine Zones. The flowers are white and star-like, small,

and borne singly or in cymes upon short, tufted, branched, leafy stems (leaves at base of stems) which are 2 to 4 inches tall. The leaves are crowded, rather succulent, spatulate in outline, small (an eighth of an inch to quarter of an inch long), and evergreen. This plant is named for Dr. William Fraser Tolmie who first collected it, presumably in Mount Rainier National Park on the occasion of his "botanizing expedition" to the northwest corner of this area in 1833.

Yellowdot saxifrage (*Saxifraga austromontana* Wieg.). Also called alpine saxifrage. A very common plant in the rocky cliffs of the Hudsonian and lower Arctic-Alpine Zones. It is densely tufted, with erect flower stems from 2 to 6 inches tall bearing small white star-like flowers (less than quarter of an inch in diameter) in cymes at the top of the stems. The white petals sometimes have brownish-yellow spots. The leaves are densely clustered at the base of the flower stems, though a few lanceolate, scale-like leaves are found upon the otherwise naked, elongated flower stems. They are lanceolate in outline, acute at the tip, have ciliate margins, are evergreen, and are somewhat leathery.

Vesper saxifrage (*Saxifraga vespertina* (Small) Fedde.). This plant closely resembles the yellowdot saxifrage. It grows on rocky cliffs in the upper Canadian and lower Hudsonian Zones. The leaves are oblong to spatulate in outline, obtuse at the tip, and with the ciliate margins more evident than in the yellowdot saxifrage. The flowers are larger than those of the yellowdot saxifrage (about quarter of an inch in diameter) with the brown spots upon the white petals quite conspicuous; the cymes are loose. It is a much more attractive plant than the yellowdot saxifrage though, unfortunately, not nearly so common.

Californian saxifrage (*Saxifraga caespitosa* L.). Found on rocky cliffs of the Arctic-Alpine Zone. It is densely tufted, 2 to 3 inches tall, with small, densely crowded, thin, 3-lobed leaves. The flower-bearing stems are naked with the exception of a few leafy bracts. The flowers are white.

Twingleaf saxifrage (*Saxifraga oppositifolia* L.). As the name indicates, the small leaves of this plant are opposite, the pairs of leaves being densely crowded along the entire stem. There is no long, naked, flower-bearing stalk, and the small, purple flowers are borne solitary at the apex of the leafy stems. It is a small plant (rarely more than 2 inches tall) of rocky locations in the Arctic-Alpine Zone.

Brook saxifrage (*Saxifraga arguta* D. Don.). A common species found in wet locations, generally along streams or upon mossy cliffs from 2,000 to 5,000 feet in elevation. The leaves are all basal, succulent, long-stemmed, broader than long (1½ to 2½ inches wide and 1 to 1½ inches long), and with the margins evenly dentate with coarse teeth. The flower stem is slender, leafless, 6 to 10 inches tall, and bears numerous white flowers in a cymose panicle. The petals of the flowers are circular in outline.

Summer saxifrage (*Saxifraga aestivalis* F. & M.). This plant and the

brook saxifrage are so similar that it is difficult to distinguish them in the field without a hand lens. The principal field distinction is that the petals of the flowers of the summer saxifrage are oblong rather than circular in outline. This species is also found at slightly higher elevations than the brook saxifrage, being most common along streams in the Hudsonian Zone.

Rustyhair saxifrage (*Saxifraga ferrugina* Graham). A fairly common plant along streams from 2,500 to 6,000 feet in elevation. It grows to be 2 to 12 inches tall, with the spatulate leaves, toothed above the middle, in a rosette at the base of the erect, slender, leafless flower stem. The leaves are half an inch to 2 inches long, narrowing to a broad, short petiole. The flowers are numerous, white, and in a cymose panicle. *Saxifraga debilis* Engelm. has 5-lobed leaves and *Saxifraga mertensiana* Bong. has leaves that are doubly toothed.

Alaska fringe-cup (*Tellima grandiflora* (Pursh.) Dougl.). The common name of this plant indicates the general appearance of the flowers, the green calyx of which is bell-like with small white petals protruding, giving the flower a "fringed" appearance. The leaves are largely basal, round in outline, and heart-shaped at the base, with the margins shallowly lobed and the lobes, in turn, toothed. Basal leaves are borne upon rather long, slender stems. The flower stems are erect, 6 to 12 inches tall, slender, and, with the exception of two or three sessile leaves, naked. The flowers are borne in a compact raceme which is usually 1-sided. The stems and leaves are sparsely covered with short hairs. It is a common plant of the moist woods of the Canadian Zone.

Menzies tolmiea (*Tolmiea menziesi* (Pursh.) T. & G.). Also commonly known as youth-on-age. This is a common plant of moist woods in the Canadian Zone and is characterized by its habit of sprouting new growth from buds at the tip of many of the leafstalks. The entire plant is sparsely hairy. The basal leaves have long, slender stems, are heart-shaped at the base, ovate in outline, with five to seven shallow lobes, the edges of which are toothed, and are from 2 to 3 inches wide and 3 to 4 inches long. Leaves upon the flower stalk are alternate and shorter stemmed. The flower stem is 10 to 24 inches tall and the flowers are borne in a raceme near the top. The flowers are short-stemmed, with the dark calyx and white petals funnel-shaped in outline.

Fivestamen miterwort (*Mitella pentandra* Hook.). Also known as bishopscap. Common in moist woods of the Humid Transition and Canadian Zones. It is 4 to 12 inches tall and is lightly covered with short hairs throughout. Leaves are all basal, round in outline, and heart-shaped at the base, the margins with rounded teeth. The flowers are in a loose raceme, flattish or saucer-like, with the petals finely divided into thread-like lobes.

Miterwort (*Mitella caulescens* Nutt.). Also common in moist woods of the Humid Transition and Canadian Zones. This plant is 10 to 25 inches

tall and resembles the bishopscap except that the flower-bearing stem has one to three short-stemmed leaves. The flowers are greenish.

Brewer miterwort (*Mitella breweri* Gray). Leaves all basal, shiny green upon the upper side and kidney-shaped to round, with numerous rounded teeth along the margin. Found from 2,000 to 5,500 feet.

Miterwort (*Mitella trifida* Graham). The leaves of this plant are all basal and have slender and conspicuously hairy stems. Leaves are kidney-shaped to heart-shaped. The margins of the leaves have numerous small teeth. The flower stems are from 6 to 10 inches tall. Not common.

Foamflower (*Tiarella* spp.). Both species of this genus which are found in this area are characteristic of the moist places in the wooded Canadian Zone. They are slender herbs, 6 to 15 inches tall, with small white flowers borne in panicles. *Tiarella unifoliata* Hook. has lobed leaves, while *Tiarella trifoliata* L. has the leaves divided into three leaflets. Also known locally as coolwort.

Leptarrhena (*Leptarrhena amplexifolia* (Sternb.) (Ser.). Found along streams in the Hudsonian Zone. The leaves are largely basal, oblong to obovate and coarsely toothed above the middle, thick and leathery, and glossy green above and light green below. The flower-bearing stem is 6 to 12 inches tall, has one or two small sessile leaves, and bears the small white flowers in a panicle.

Alumroot (*Heuchera micrantha* Dougl.). A common plant in moist places of the Canadian Zone, being particularly noticeable upon moist cliffs. The leaves are mostly basal, round to slightly oblong and heart-shaped at the base, the margins lobed and the lobes toothed. The leaves are 1 to 2½ inches wide and have slender stems that are covered with short reddish hairs. The white flowers are in a loose panicle borne upon a stem from 12 to 24 inches tall.

Alumroot (*Heuchera glabra* Willd.). Resembles *H. micrantha* except that the lobes are triangular in outline rather than rounded and the stems are not hairy. It is also somewhat smaller.

Alumroot (*Heuchera racemosa* Wats.). A plant common on moist rocks, particularly in the Hudsonian Zone. It has slightly hairy basal leaves that are broader than long and heart-shaped at the base with the margins slightly lobed and with rounded teeth. The leaves have long stems. The white, bell-shaped flowers are in a raceme.

Two other genera—*Boykinia* and *Suksdorfia*—are represented in the park by only one species each. Neither is common. They may be identified from the field key to the saxifrage family (p. 96).

Lewis mockorange (*Philadelphus lewisi* Pursh.). A woody shrub 4 to 10 feet tall, much-branched, and with pale brown, flaky bark and ovate, opposite leaves. The margins of the leaves have a few teeth. The flowers are white and showy. It is an occasional plant in the upper Canadian Zone. Also known locally as syringa.

Currants and Gooseberries (Ribes). This is a very important genus of plants in the saxifrage family. All are shrubs and some have prickly or thorny stems. The leaves are alternate and sometimes fascicled and are palmately veined or lobed. The flowers are small, solitary or in racemes, and variously colored; the berry is round, fleshy, and usually possessed of many seeds. Plants of this group are of particular importance in this national park as they are elsewhere in the Northwest, in that they serve as the alternate host for the white pine blister rust which has done considerable damage to the western white pine.

Prickly currant (Ribes lacustre (Pers.) Poir.). This plant has a stout woody stem 3 to 6 feet tall with three to five branched spines and numerous prickles. The leaves are from 1 to 2 inches wide and about as long as wide, 5-lobed, and with the margins of the lobes toothed. The flowers are small, saucer-like, greenish to purplish, and in loose drooping racemes. The berries are black and glandular. This is a common plant at low elevations in the park.

Sink currant (Ribes bracteosum Dougl.). This plant has stout stems, 3 to 6 feet tall, without spines or prickles. The leaves are very large (6 to 8 inches wide) and about as wide as long; heart-shaped at the base, and with five to seven prominent triangular-shaped lobes, the margins of which are toothed. The flowers are numerous, green, saucer-shaped, and borne in erect racemes 4 to 8 inches long. The fruit is black and dotted with resin. It is a common low-elevation currant in the park.

Mapleleaf currant (Ribes acerifolium). Common in the Hudsonian Zone from 4,500 to 6,500 feet. It is shrubby, with woody stems 3 to 6 feet tall, but the stout stems have no spines or prickles. The leaves are about 2 inches across and about as broad as long, with three to five prominent lobes having numerous rounded teeth. The flowers are greenish, saucer-shaped, and in drooping racemes. The black fruit is not edible.

Sticky currant (Ribes viscosissimum Pursh.). A shrubby plant about 3 feet tall and without prickles. It is somewhat hairy, especially upon new growth. The leaves are 1 to 2 inches across with three to five rounded lobes whose margins are toothed. The flowers are small, white, and in racemes; the berry is black. This plant is not common, being found only at low elevations in the White River area up to 4,000 feet.

Trailing black currant (Ribes laxiflorum Pursh.). Grows from 3 to 6 feet tall and has no spines or thorns. The leaves are 5- to 7-lobed, with the lobes triangular in outline, their margins toothed. The flowers are in erect racemes and saucer-shaped. The fruit is black.

Winter currant (Ribes sanguineum Pursh.). A showy plant of the low elevations in early summer. Grows from 3 to 8 feet tall and has tubular pink to red flowers in drooping racemes. The leaves are nearly round in outline, 1 to 3 inches wide and with three to five rounded lobes, the margins

of which are toothed. It has no prickles and the berry is black. Also known locally as redflowering currant.

Straggly gooseberry (*Ribes divaricatum* Dougl.). The stout stems of this plant are armed with numerous prickles and stout spines. The leaves are 1 to 1½ inches across and about as broad as long with three to five lobes, the margins of which are toothed. The leaves are also somewhat hairy upon the under side. The white flowers are few in number and the berry is black.

Lobbs gooseberry (*Ribes lobbi* Gray). The stout branches of this plant have spines but not bristles. The leaves are small—about half an inch to three-quarters of an inch across and about as broad as long. The leaves are also heart-shaped at the base and have three to five lobes, the margins of which are toothed. The flowers are solitary or in threes, drooping and purple-red. The berries are large, gummy, and covered with stalked glands.

Watson gooseberry (*Ribes watsonianum* Koehme). This shrub grows 3 to 5 feet high and has straw-colored spines at the nodes only. Leaves are 1 to 1½ inches wide, 3- to 5-lobed, with margins of lobes deeply toothed. Flowers inconspicuous, in clusters of one to three. The fruits are covered with straw-colored spines.

ROSE FAMILY (ROSACEAE)

This is a large family, the individual members of which vary greatly in appearance. However, all have alternate leaves (which may be either simple or compound) and regular, perfect flowers. A field key follows:

- 1. Leaves simple, toothed or lobed. 2
- 1. Leaves compound with 3 or more leaflets. 10
- 2. Plant prostrate, forming dense mats
 - Mount Washington dryad* (*Dryas octopetala*) (p. 103)
- 2. Plants erect 3
- 3. Woody shrubs or trees. 4
- 3. Herbaceous plants 2 to 6 inches tall, often growing in compact patches; leaves 2- to 3-cleft into narrow lobes; flowers white and in dense racemes *Alaska spirea* (*Luetkea pectinata*) (p. 103)
- 4. Leaves large, 4 to 6 inches across; fruit fleshy like a raspberry
 - Rubus* spp. (p. 103)
- 4. Leaves smaller than above 5
- 5. Flowers in racemes 6
- 5. Flowers otherwise than in racemes. 7
- 6. Leaves oblanceolate, 2 to 4 inches long
 - Osoberry* (*Osmaronia cerasiformis*) (p. 104)
- 6. Leaves oblong, three-quarters of an inch to 1½ inches long
 - Pacific serviceberry* (*Amelanchier florida*) (p. 104)

7. Flowers in large pointed terminal panicles, small and white; a tall shrub, 6 to 15 feet high
Creambush rockspirea (*Holodiscus discolor*) (p. 104)
7. Flowers not in large pointed panicles—in cymes, corymbs, or occasionally, panicles 8
8. Flowers in cymes; plant, a small tree
Oregon crabapple (*Malus fusca*) (p. 104)
8. Flowers in corymbs or occasionally in panicles. 9
9. Flowers in corymbs only; corymbs loose, not flat-topped and few-flowered; flowers rather large, nearly half an inch broad; plant, a tree *Bitter cherry* (*Prunus emarginata* var. *mollis*) (p. 104)
9. Flowers generally in dense flat-topped corymbs (2 rarer species in this genus have flowers in dense panicles); plants, shrubs; not trees *Spirea* (*Spiraea* spp.) (p. 105)
10. Plants shrubby 11
10. Plants herbaceous. 14
11. Plants with prickles or bristles. 12
11. Plants without prickles or bristles 13
12. Flowers white or salmon-colored; fruit like a raspberry or blackberry *Rubus* spp. (p. 103)
12. Flowers pink; fruit red, smooth outside and open at the top and containing numerous seed-like akenes within . . . *Rosa* spp. (p. 105)
13. A low plant not more than 8 inches tall; flowers yellow and the fruit dry *Cinquefoil* (*Potentilla* spp.) (p. 105)
13. Tall shrub, 6 to 15 feet high; flowers white, in dense cymes; fruit fleshy and red when ripe *Mountainash* (*Sorbus* spp.) (p. 106)
14. Leaflets 3 to 5 and all attached at the end of a leafstalk. 15
14. Leaflets 5 or more and some attached on the side of the leafstalk 18
15. Plants with runners or creeping stems; petals white and fruit juicy 16
15. Plants without runners 17
16. Leaflets 3; fruit red and fleshy and bearing seed-like akenes upon the outside *Strauberry* (*Fragaria* spp.) (p. 106)
16. Leaflets 5; fruit of a few small 1-seeded drupes . . *Rubus* spp. (p. 103)
17. Stamens 5; petals shorter than the sepals; plants less than 4 inches tall *Wineleaf cinquefoil* (*Potentilla tridentata*) (p. 106)
17. Stamens 20; petals generally much longer than the sepals; plant usually more than 4 inches tall . . *Cinquefoil* (*Potentilla* spp.) (p. 105)

- 18. Tall, bushy plant, erect stiff stems, 3 to 6 feet tall; flowers white, small, in open panicles to form long feathery plumes

Goatsbeard (*Aruncus sylvestris*) (p. 115)
- 18. Smaller plants, less than 3 feet tall. 19
- 19. Flowers yellow 20
- 19. Flowers not yellow, instead white or dark purple 21
- 20. Akenes beaked in age . . *Largeleaf avens* (*Geum macrophyllum*) (p. 115)
- 20. Akenes not beaked *Cinquefoil* (*Potentilla* spp.) (p. 105)
- 21. Flowers, white, in dense terminal spikes

Sitka burnet (*Sanguisorba sitchensis*) (p. 115)
- 21. Flowers dark purple, in few-flowered cymes

Marsh cinquefoil (*Potentilla palustris*) (p. 106)

Mount Washington dryad (*Dryas octopetala* L.). A dwarfed, tufted, shrubby plant of high altitudes with showy, cream-colored or white flowers. This plant often forms mats upon the barren soils. The leaves, which are oblong-ovate in outline, have numerous small rounded teeth along the margins and are densely covered with fine grey hairs on the under side.

Alaska spirea (*Luetkea pectinata* (Pursh.) Kuntze). A very common plant in moist soils of the Hudsonian meadows, often forming dense mats. It is 2 to 4 inches tall, with small leaves that are finely dissected into two or three narrow lobes, and with dense terminal racemes of creamy-white flowers.

Salmonberry (*Rubus spectabilis* Pursh.). A very common plant in open locations in the woods of the Humid Transition and Canadian Zones, usually where there is ample moisture. It is a shrubby plant, 3 to 6 feet tall, with stems having numerous weak prickles. It often forms dense thickets. The leaves are compound, mostly with three leaflets which are ovate in outline, acute at the tip, and with the margins coarsely toothed. The flowers are red. The fruit is yellow to deep salmon in color, raspberry-like, and edible, but not very tasty.

Western thimbleberry (*Rubus parviflorus* Nutt.). Fairly common in open situations in the woods of the Humid Transition and Canadian Zones. It is a shrubby plant from 2 to 4 feet tall. The stems are entirely lacking in prickles or thorns. The leaves are very large (4 to 8 inches broad), with five triangular-shaped lobes, the edges of which are coarsely and irregularly toothed. The large white flowers are very attractive; the fruit is red, raspberry-like, and juicy.

Trailing blackberry (*Rubus macropetalus* Dougl.). This plant has prickly, trailing stems 3 to 15 feet long that are somewhat woody and which bear numerous short flowering branches. The leaves are compound into three leaflets (sometimes five) which are ovate in outline and acute at

the tip and have the margins coarsely and often doubly toothed. The flowers are white. The fruit, when ripe, is black and very palatable.

Whitebark raspberry (*Rubus leucodermis* Dougl.). An erect, shrubby plant, 3 to 6 feet tall, with somewhat woody stems that have numerous stout prickles. Leaves compound, with three (sometimes five) leaflets whose margins are doubly toothed, covered with white hairs on the under side. The flowers are white, small, and borne in few-flowered corymbs. The fruit is round, about half an inch in diameter, and nearly black when mature.

Snow dewberry (*Rubus nivalis* Dougl.). This plant has woody, trailing, slender stems with numerous, small weak prickles. The leaves are simple, lobed or compound with the margins doubly toothed.

Trailing rubus (*Rubus pedatus* Smith). Quite common. It has herbaceous trailing stems without prickles. Leaves compound with three to five leaflets, their margins toothed. The flowers are white and the fruit is red.

Birdsfoot bramble (*Rubus lasiococcus* A. Gray). Common in the Canadian Zone. It has trailing, herbaceous stems with broadly ovate 3- to 5-lobed (occasionally with three leaflets) leaves with toothed margins. The white flowers are borne solitary and the fruit is red.

Osoberry (*Osmaronia cerasiformis* (T & G) Greene). An uncommon shrub, 6 to 12 feet tall, found in moist to wet locations at the lower elevations. It has simple, broadly oblanceolate, acute leaves 2 to 4 inches long. The leaf margins are not toothed. The white flowers are borne in loose, nodding racemes. The fruit is bitter and consists of from one to four oblong 1-seeded drupes with a thin pulp surrounding the stone.

Pacific serviceberry (*Amelanchier florida* Lindl.). A shrub 6 to 12 feet tall. The leaves are broadly oblong in outline, three-quarters of an inch to 1½ inches long, obtuse at the tip, and with margins toothed above the middle. The showy white flowers are borne in racemes 1½ to 3 inches long.

Creambush rockspirea (*Holodiscus discolor* (Pursh.) Maxim.). A tall shrub, 6 to 15 feet high, with leaves triangular-ovate in outline and half an inch to 1½ inches long; leaf margins coarsely toothed; under side of leaves grey-green and with numerous grey hairs; upper portion green and hairless. The flowers are numerous, small and white, and borne in broad panicles. This is a common shrub in open situations at the lower elevations. Also known as ocean spray.

Oregon crabapple (*Malus fusca*). This small tree, 15 to 30 feet tall, is occasionally found in moist to wet locations at the lower elevations. The leaves are ovate-lanceolate in outline, acute, with toothed margins, usually simple, but occasionally lobed, and from 1 to 3 inches long. The flowers are white and borne in loose cymes; the fruit is oblong, depressed at both ends, and greenish.

Bitter cherry (*Prunus emarginata* (Dougl.) Walp., var. *mollis* (Dougl.)

Brewer). A tree, 20 to 50 feet tall, occasionally noted at low elevations. As in the case of cultivated cherry trees, the bark of this species is brown with prominent lenticels. The leaves are narrow, ovate-oblong to obovate, 1 to 3 inches long, short-stemmed, and with the margins finely toothed. The white flowers are in corymbs and appear with the leaves. The fruit is red and quite bitter.

Subalpine spirea (*Spiraea densiflora* Nutt.). A common shrub of the Hudsonian Zone. It is 12 to 36 inches tall with dense flat-topped corymbs of small rosy-red flowers. The plant is very leafy; the leaves ovate in outline, 1 to 1½ inches long, and toothed above the middle. Also known as rosy spirea.

Menzies spirea (*Spiraea menziesi* Hook.). Locally known as hardhack. Found in the Canadian Zone in moist to swampy locations. It grows 3 to 4 feet tall, has oblong, rounded leaves which are coarsely toothed above the middle and green on both sides and are from 1 to 3 inches long. The small rosy-red flowers are borne in dense terminal panicles. *Douglas spirea*, (*Spiraea douglasi* Hook.), also known as hardhack, grows in somewhat similar situations and resembles *S. menziesi* in many ways except that its leaves are hairy on the underside.

Shinyleaf spirea (*Spiraea lucida* Dougl.). A rare plant, 12 to 24 inches tall, with leaves coarsely toothed above the middle and with dense flat-topped corymbs of white flowers.

Baldhip rose (*Rosa gymnocarpa* Nutt.). A small shrub not more than 3 feet tall, with slender stems armed with numerous slender prickles. The leaves are compound, with leaflets up to 1 inch long, five to nine in number, oblong, and with margins toothed. The flowers are borne singly, are pink to light red and are about three-quarters of an inch in diameter. Also known as sweetbrier.

Nootka rose (*Rosa nutkana* Presl.). This is a larger plant than the above, with stout stems having very few stout prickles. Leaves are compound; leaflets five to seven, ovate, coarsely toothed, and up to 1½ inches long. The flower is generally borne singly and is larger than the flower of *R. gymnocarpa*.

Fanleaf cinquefoil (*Potentilla flabellifolia* Hook.). One of the most common plants of the Hudsonian Zone. The blossom has a superficial resemblance to that of the buttercup, but the presence of green sepals and notched petals readily distinguishes this plant from the buttercup. The flowers are bright yellow, half an inch to three-quarters of an inch in diameter, and borne in loose cymes. The leaves are compound, with the three leaflets wedge-shaped and widest at the top and toothed above the middle. The plant is from 6 to 12 inches tall.

Northwest cinquefoil (*Potentilla gracilis* Dougl.). Found at lower elevations but not very common. It grows to be 12 to 24 inches tall and is covered with silky white hairs. The leaves are compound, with five to

seven digitate leaflets. The tall stem and silky character readily distinguish this species from the others.

Marsh cinquefoil (*Potentilla palustris* L.). A plant of swampy or exceedingly wet places at lower elevations such as in the Longmire swamp where it is fairly common. The stems, 1 to 3 feet long, recline upon the ground with the ends erect. Leaves compound, with five to seven leaflets which are oblong, 1 to 3 inches long, and coarsely toothed. The flowers are large, dark purple, and borne in a loose few-flowered cyme.

Wineleaf cinquefoil (*Potentilla tridentata*). A dwarfed, slightly woody perennial with thick compound leaves; leaflets, three in number, wedge-shaped, and slightly hairy. Leaves are largely borne toward the ends of the densely clustered stems. The flowers are yellow and borne upon leafless stalks.

Bush cinquefoil (*Potentilla fruticosa* L.). A plant of rocky locations in the Hudsonian and lower Arctic-Alpine Zones. It is a small shrubby plant, 6 to 16 inches tall with a stout woody stem. The leaves are compound with five to seven linear leaflets, acute at the tip, and quarter of an inch to three-quarters of an inch long. Leaves also somewhat silky. The bright yellow flowers are borne singly in the leaf axils. There are six other species included in this genus, but these are not apt to be encountered by the average visitor. These are *Potentilla glandulosa* Lindl., *P. norvegica* L., var. *hirsuta* (Michx.) Lehm., *P. palustris* (L.) Scop., *P. villosa* Pall., *P. diversifolia* Lehm., and *P. millograna* Engem.

Cascade mountainash (*Sorbus cascadiensis* G. N. Jones). A tall shrub, 6 to 15 feet tall, that is common in the park from about 3,000 to 6,000 feet. The leaves are compound with 9 to 11 oval to oblong leaflets (1 to 2½ inches long) having the margins sharply toothed along their entire length. It is further characterized by dense compound cymes of white flowers and berries that are bright red when ripe. The leaflets are also toothed along the entire margin. *Sorbus occidentalis*, known as *western mountainash*, resembles cascade mountainash in many respects, but is somewhat smaller, the cymes of white flowers are smaller, the leaflets are toothed only along the upper portion of the margins, and the berries, when ripe, are rather purple.

Bracted strawberry (*Fragaria bracteata* Heller). This is the most common of three species of this genus which are found in the park. It has stout rootstocks and long, conspicuous, slender "runners." The leaves are basal, tufted, thin, and compound with three broadly ovate leaflets having toothed margins. The entire plant is densely covered with silky hairs. Flowers are white and upon long slender stalks. The fruit is fleshy and strawberry-like. The two other native species, *Fragaria cuneifolia* Nutt. and *Fragaria chiloensis* (L.) Duch., differ from the most common one just described in that their leaves are somewhat thicker.



Figure 71.—BUNCHBERRY DOGWOOD (fruit) (*Cornus canadensis*).



Figure 72.—BARBER-POLE (*Allostropa virgata*). Natt Dodge Photo.



Figure 73.—SINGLEFLOWERED INDIANPIPE (*Monotropa uniflora*). Lindsley Photo.

Figure 74.—MANYFLOWERED INDIAN-
PIPE (*Monotropa hypopitys*).



Figure 75.—COMMON PIPSISSEWA
(*Chimaphila umbellata*).





Figure 76.—PYROLA (*Pyrula bracteata*).

Figure 77.—CASCADES AZALEA (*Rhododendron albiflorum*). Lindsley Photo.





Figure 78.—*MERTENS CASSINII* (*Clematis menziesiana*).

Figure 79.—*RED MOUNTAIN GRAFT* (*Phyllodoce empetrifolia*). Lindley Photo.





Figure 80.—RUSTY MENZIESIA [*Menziesia ferruginea*].

Figure 81.—RED WHORTLEBERRY [*Vaccinium parvifolium*].

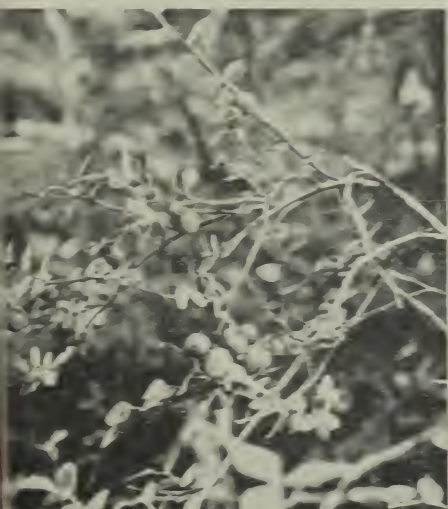


Figure 82.—SALAL [*Gaultheria shallon*].





Figure 83.—BEARBERRY (*Arctostaphylos uva-ursi*).

Figure 84.—FOLIAGE AND FLOWERS OF PACIFIC MADRONE (*Arbutus menziesi*).
BACKGROUND RULED IN INCH SQUARES.

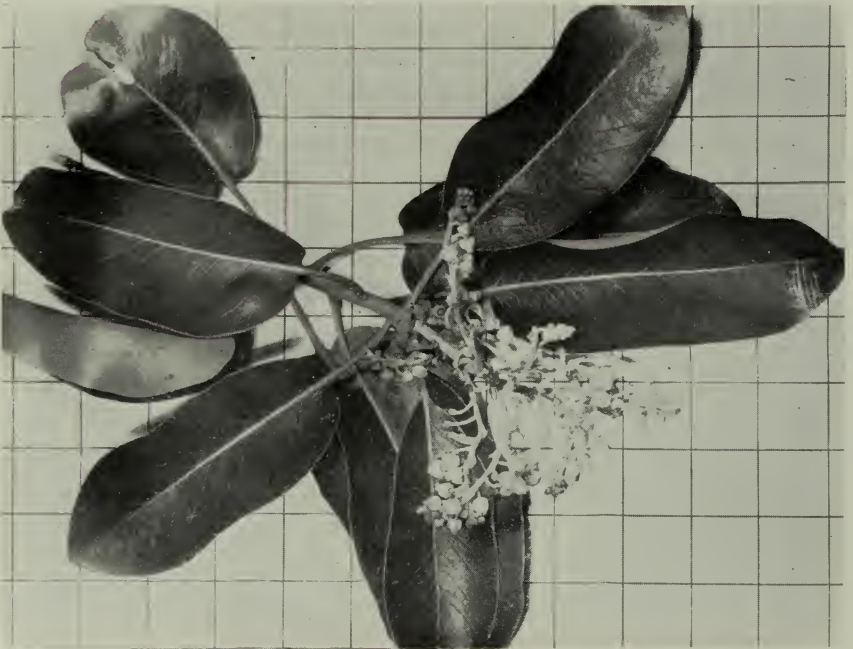




Figure 85.—JEFFREY
SHOOTINGSTAR (*Dodecatheon jeffreyi*).

Figure 86.—RAINIER PLEATED GENTIAN (*Gentiana calycosa*). Lindsley Photo.





Figure 87.—SPREADING PHLOX (*Phlox diffusa*).

Figure 88.—NUTTALL GILIA (*Gilia nuttalli*).



Sylvan goatsbeard (*Aruncus sylvester* Kostel). A common herbaceous plant found up to 4,000 feet. It grows 3 to 6 feet tall and has spreading, erect stalks, bearing the numerous small white flowers in large terminal panicles. These flower clusters probably account for the common name. Leaves are compound with ovate to lanceolate leaflets, 2 to 4 inches long, with the margins doubly toothed.

Largeleaf avens (*Geum macrophyllum* Wild.). A tall plant with a stout, erect, hairy stalk from 1 to 3 feet tall with large "lyre-shaped" divided leaves—the terminal lobe being the largest. The flowers are a bright yellow, borne in a loose cyme, which later develop into round burrs with hooked prickles. This plant is fairly common in moist open places in the Canadian Zone.

Sitka burnet (*Sanguisorba sitchensis* C. A. Mey). A tall, erect perennial 1 to 3 feet high, with compound leaves arising from the base of the flower-bearing stalk that may be either simple or branched near the top. Leaves are also present on the flower-bearing stalk. Leaflets are in 5 to 10 pairs, oval in outline, 1 to 1½ inches long, and coarsely toothed. The white flowers are borne in a dense terminal spike. Generally in wet places from 4,000 to 6,000 feet.

PEA FAMILY (LEGUMINOSAE)

The members of this important family can be readily identified by their typical irregular, sweetpea-like flowers, and bean-like pods. A field key to the six genera represented in this area follows:

- 1. Leaves with 3 or more leaflets attached at the end of the leafstalk 2
- 1. Leaves with 5 or more leaflets, some attached along the sides of the leafstalk 3
- 2. Leaflets 5 or more *Lupine* (*Lupinus* spp.) (p. 115)
- 2. Leaflets 3. 5
- 3. Leaves with a tendril at the end; plant vine-like; flowers solitary or in racemes 4
- 3. Leaves never with tendrils; low-tufted plant with thick root; flowers in dense spike *Crazyweed* (*Oxytropis* spp.) (p. 116)
- 4. Style thread-shaped and hairy near the tip only *Vetch* (*Vicia* spp.) (p. 116)
- 4. Style flattened and hairy on the inner side. *Peavine* (*Lathyrus* spp.) (p. 116)
- 5. Flowers in heads *Clover* (*Trifolium* spp.) (p. 116)
- 5. Flowers in racemes *Medic* (*Medicago* spp.) (p. 117)

Subalpine lupine (*Lupinus subalpinus* P. & R.). One of two common blue lupines that are typical of the Hudsonian Zone, this species being

generally the more abundant and more characteristic of the lower portions of the Hudsonian meadows in good soils (4,500 to 6,000 feet). It often forms large patches that are striking because of the beauty of the blue flowers. It is a leafy plant, 8 to 16 inches tall, with simple stems bearing compact terminal racemes of violet-blue flowers. Several stems often arise from the same crown. The leaflets, five to seven in number and 1 to 2 inches long, are spatulate in outline. The plant is sparsely hairy. This characteristic usually is not visible unless the plant is examined through a hand lens.

Volcano lupine (*Lupinus volcanicus* Greene). The second of the two common blue lupines of the Hudsonian Zone, this one preferring a drier soil, usually volcanic ash, and growing more in the upper portions of this zone from about 5,500 to 6,500 feet. It may be readily identified from the common blue lupine in that it is conspicuously hairy. The stems are simple and leafy, about 8 to 16 inches tall, with oblanceolate leaves, half of an inch to $1\frac{1}{4}$ inches long. The light blue flowers are borne in racemes.

Lyall lupine (*Lupinus lyalli* A. Gray). A common and very distinctive plant of the Arctic-Alpine Zone, growing in dry, rocky soils. This is characteristically a low, tufted, flat-spreading plant with the foliage densely covered with silky hairs. The leaflets are small, not more than half an inch long and usually much shorter, with erect flower stems, 3 to 4 inches tall, bearing short racemes of small deep blue flowers. The Lyall lupine is one of the most attractive plants of the Arctic-Alpine Zone.

Mountain crazyweed (*Oxytropis mazama* St. John). In rocky soils of the Hudsonian Zone but not common. This is a low-tufted perennial with a thick rootstock and very short stems from which arise a number of the leaf and flower stalks, 4 to 10 inches tall. The leaves are compound, being composed of 8 to 12 pair of slightly hairy, elliptic-lanceolate leaflets less than half an inch long. The flowers are pale yellow and borne in terminal spikes 1 to $1\frac{1}{2}$ inches long.

American vetch (*Vicia americana* Muhl.). A slender, prostrate or climbing perennial with well-developed tendrils. The flowers are purple, 4 to 8 in number upon slender stalks arising from the axils of the leaves. The leaves are compound with 8 to 16 ovate to oblong leaflets (half an inch to 1 inch long and quarter of an inch to half an inch wide) which have a short, slender point at the apex (cuspidate).

Narrowleaf vetch (*Vicia angustifolia* L.). Similar to the common vetch except that the leaves are smaller and linear.

Fewflower peavine (*Lathyrus pauciflorus* Fernald). A climbing perennial with angled stems, violet flowers, and simple or branched slender tendrils. Another species, *Lathyrus nuttalli* Wats., has very small, inconspicuous tendrils, and is generally erect and nonclimbing.

Clover (*Trifolium* spp.). Nearly everyone is familiar with the characteristics of clover, four species of which grow in the park. The red clover

is *Trifolium pratense* L.; suckling or yellow clover is *Trifolium dubium* L.; alsike clover (*Trifolium hybridum* L.) has pinkish to purple flowers; and white clover is *Trifolium repens* L.

Medic (*Medicago* spp.). This genus is represented in the park by two species—*black medic* (*Medicago lupulina* L.), a roadside weed with small yellow flowers that is often mistaken for yellow clover, and *alfalfa* (*Medicago sativa* L.) which has purple flowers.

GERANIUM FAMILY (GERANIACEAE)

Small geranium (*Geranium pusillum* Burm.). An uncommon plant of the wooded zones. It has small pink or violet flowers and palmately lobed leaves about an inch in diameter.

WOODSORREL FAMILY (OXALIDACEAE)

Oregon oxalis (*Oxalis oregana* Nutt.). A very common plant in the deep woods at the lower elevations, often forming dense patches in moist soils. It has clover-like leaves, borne upon slender stems, which arise from the root in a sort of loose tuft. The flowers are white with the petals faintly veined with purple and are borne upon slender leafless stems. The plant is from 4 to 6 inches tall. Another species, *Oxalis trillifolia* Hook. is very similar to *O. oregana* and often grows in company with it, but the flowers are borne several upon the stem rather than singly. These plants are also known locally as woodsorrel.

WATERSTARWORT FAMILY (CALLITRICHACEAE)

Waterstarwort (*Callitriche* spp.). The two species—*C. hermaphroditica* L. and *C. palustris* L.—which are found in the park are small, uncommon, slender aquatic herbs that are not likely to be encountered by the average visitor. They have opposite, entire leaves and inconspicuous, imperfect flowers, the staminate flower being a single stamen and the pistillate flower consisting of an ovary and two stigmas. They are found at low elevations in ponds or along small streams.

STAFF TREE FAMILY (CELASTRACEAE)

Myrtle pachistima (*Pachistima myrsinites* (Pursh.) Raf.). A rather common, low-growing, evergreen bushy shrub, 12 to 24 inches tall, found in open situations in the Canadian Zone. The small leaves (half an inch to three-quarters of an inch long) are opposite and are joined to the branches by very short stems. The margin is slightly toothed above the middle and slightly inrolled. The flowers are small, purplish-green, and are borne in the leaf axils. Also known locally as mountain box.

CROWBERRY FAMILY (EMPETRACEAE)

Black crowberry (*Empetrum nigrum* L.). A small, low, spreading shrub from 2 to 8 inches long, with very small, thick, linear leaves and inconspicuous flowers. The common name is derived from the small black berry which is the fruit. It is a rare plant of the high alpine country.

MAPLE FAMILY (ACERACEAE)

Vine maple (*Acer circinatum* Pursh.). A very common shrub, 9 to 20 feet tall, found in the park up to about 4,500 feet in elevation. The typical maple leaves are divided into seven to nine lobes, the edges of which are conspicuously toothed. The small reddish flowers are borne in loose corymbs. This plant is partly responsible for the gorgeous flaming red patches of color characteristic of the park in early October. The fruit is the characteristic double, winged samara as in the case of all maples.

Dwarf maple (Douglas Rocky Mt. maple) (*Acer glabrum douglasi* (Hook.) Dippel). Also known locally as Douglas maple. This is found in locations similar to the vine maple but is not so common. The leaves are 5-lobed, the lower two lobes being quite small, with the margins very coarsely toothed.

Bigleaf maple (*Acer macrophyllum* Pursh.). An occasional tree in moist situations, especially along streams, at the lower elevations. It can be easily recognized by the large leaves which are 6 to 10 inches broad and deeply 3- to 5-lobed. The flowers, which appear just before the leaves, are greenish-yellow, fragrant, and borne in elongated, pendent racemes.

BUCKTHORN FAMILY (RHAMNACEAE)

Cascara buckthorn (*Rhamnus purshiana* DC.). A small tree, 10 to 20 feet tall, that is rather rare in the park. It has dark grey bark, alternate leaves, and small greenish flowers borne in umbels. The fruit is black and about the size of a pea.

Varnisbleaf ceanothus (*Ceanothus velutinus* Dougl., var. *laevigatus* (Dougl.) T & G). A much-branched shrub, 3 to 4 feet tall with stout branches and thick, oval, finely toothed leaves 1¼ to 3 inches long. The leaves are further characterized by being dark green and sticky upon the upper surface and grey-green beneath, and by having short stout stems and three prominent veins. The flowers are small and white and are borne in panicles. This plant is quite common in the lower Stevens Canyon area. Also known locally as sticky laurel.

Redstem ceanothus (*Ceanothus sanguineus* Pursh.). A woody shrub, 3 to 4 feet tall, with thin, oval, finely toothed leaves. The flowers are white, small, and borne in panicles. This plant is not sticky as is the previously described species. Known locally as buckbrush.

MALLOW FAMILY (MALVACEAE)

Running mallow (*Malva rotundifolia* L.). A weed with a prostrate stem 6 to 24 inches long that is often branched near the base. The leaves, three-quarters of an inch to 2 inches wide, are either round or kidney-shaped in general outline and have five to seven lobes, the margins of which have numerous small, rounded teeth. The flowers are white.

ST. JOHNSWORT FAMILY (HYPERICACEAE)

Trailing St. Johnswort (*Hypericum anagalloides* C. & S.). A plant of wet to marshy locations and fairly common in the Longmire meadow. It is a succulent, much-branched herb with slender, prostrate, and weak stems from 1 to 4 inches in length. The leaves are opposite, sessile, ovate, and quarter of an inch or less in length. The flowers are small and yellow.

VIOLET FAMILY (VIOLACEAE)

Seven species of violets are native to Mount Rainier National Park. The most common and readily observed are the *pioneer violet* (*Viola glabella* Nutt.) which is characterized by yellow flowers and is customarily known as johnny-jump-up, and the common blue species—*hook violet* (*Viola adunca* Smith). Both are plants of the early spring and summer and grow in moist soils in the Canadian Zone. The yellow violet noted above is from 4 to 8 inches tall and has long-stemmed, kidney-shaped to heart-shaped leaves. Two other yellow violets are found in the park—the *darkwoods violet* (*Viola orbiculata* Geyer) which has round leaves and is thus locally known as the roundleaved yellow violet, and the *Redwoods violet* (*Viola sempervirens* Dougl.) which is an evergreen species. Two species of blue or purple violets, in addition to the common one noted above, also occur in the park—the *marsh violet* (*Viola palustris* L.) and the *Howell violet* (*Viola howelli* Gray). The seventh species is a *white violet* (*Viola palens* (Banks) Brainard).

EVENING PRIMROSE FAMILY (ONAGRACEAE)

Alpine circaea (*Circaea alpina* L.). Also known as enchanters-nightshade. This is a plant of moist, shaded locations in the woods of the Canadian Zone but, as it is not very conspicuous, will often be overlooked. It is a succulent herb 6 to 12 inches tall, with opposite leaves upon slender stems, 1 to 2 inches long and ovate to heart-shaped in outline, with the margins sparsely toothed. The flowers are small, white, and borne upon slender-stemmed racemes that arise from the axils of the leaves.

Fireweed (*Epilobium angustifolium* L.). This tall, erect perennial, about 3 to 4 feet high, with its raceme of vivid rose-purple flowers, is conspicuous in old burns, in open woods, and along roadsides. It is found in the park from the lowest elevations to well within the Hudsonian Zone.

In the late summer the showy flowers give way to the seeds which are characterized by a tuft of silky white hairs. The numerous leaves are 3 to 5 inches long, alternate on the stem, and lanceolate.

Yellow willowweed (*Epilobium luteum* Pursh.). A common plant in moist situations, particularly along streams, at elevations of from 3,500 to 5,500 feet. It is from 8 to 16 inches tall, with opposite, usually sessile, elliptic leaves that are 1 to 2 inches long and have finely toothed margins. The flowers are showy and a light yellow.

Alpine willowweed (*Epilobium alpinum* L.). An erect, succulent plant 4 to 12 inches tall with opposite ovate leaves that are three-quarters of an inch to 1½ inches long and have finely toothed margins. The flowers are pink to purple. This plant is common in wet places in the Hudsonian Zone.

Eight additional species of *Epilobium* are found in the park but as these are either uncommon or inconspicuous they are merely listed. These are *Epilobium adenocaulon* Haussk., *E. fastigiatum* (Nutt.) Piper, *E. glandulosum* Lehm., *E. hornemanni* Riech., *E. latifolium* L., *E. minutum* Lindl., *E. paniculatum* Nutt., and *E. pulchrum* Suksd.

Groundsmoke (*Gayophytum ramosissimum* T & G.). A plant of dry locations that will rarely be noticed as it is not very attractive. It is much-branched, 6 to 12 inches tall, with small linear leaves and small pink flowers.

WATER MILFOIL FAMILY (HALORIGIDACEAE)

Marestail (*Hippuris vulgaris* L.). This species, together with another—*Hippuris montana* Ledeb.—are found along the borders of ponds or lakes. The latter is fairly common in such situations in the Hudsonian Zone, while the former is more characteristic of lower levels. Neither plant is very attractive and consequently may be overlooked. They have simple erect stems and linear leaves in whorls upon the stem.

GINSENG FAMILY (ARALIACEAE)

Devilsclub (*Oplopanax horridus* (Smith) Miguel). One of the most common and conspicuous plants of the deep woods of the lower elevations. It is characterized by large, maple-like leaves 4 to 12 inches broad which are borne at the apex of the stem. The stout stem and the under side of the large leaves are covered with numerous spines. The green flowers are borne in an erect raceme which give way to bright red berries in the late summer.

PARSLEY FAMILY (UMBELLIFERAE)

This family can be readily recognized by the fact that the small yellow or white (sometimes tinged pinkish) flowers are borne in umbels. In ad-

dition, the stems are usually hollow. The carrot, parsley, and parsnip are some common cultivated vegetables that belong to this family.

1. Fruit more or less bristly 2
1. Fruit not bristly 3
2. Bristles hooked and covering the entire surface of the fruit; flowers yellow *Sanicle* (*Sanicula septentrionalis*) (p. 121)
2. Bristles only upon the ribs of the fruit . *Sweetroot* (*Osmorhiza* spp.)(p. 121)
3. Tall plants, 12 inches tall or taller, with stems very evident . . . 5
3. Short plants less than 12 inches tall, not with evident stems . . . 4
4. Leaflets dissected *Lomatium* (*Lomatium* spp.) (p. 121)
4. Leaflets not dissected, entire
Hesperoginia (*Hesperoginia stricklandi*) (p. 122)
5. Plants with a very thick stem quarter of an inch to half an inch toward base. 6
5. Plants with more slender stems than above. 8
6. Plant pubescent; 2 to 4 feet tall; in moist to wet soils
Common cowparsnip (*Heracleum lanatum*) (p. 122)
6. Plant glabrous 7
7. Fruit flattened dorsally *Waterhemlock* (*Cicuta* spp.) (p. 122)
7. Fruit compressed laterally *Angelica* (*Angelica* spp.) (p. 122)

Sanicle (*Sanicula septentrionalis* Greene). An erect, slender plant, 4 to 12 inches tall, with small yellow flowers and bristly or burr-like fruit. Found on dry rocky slopes of the Canadian Zone.

Sweetroot (*Osmorhiza* spp.). Four species of this genus—*Osmorhiza leibergeri* (C. & R.) Blankenship, *O. ambigua* (Gray) C. & R., *O. brevipes* (C. & R.) Suksdorf, and *O. divaricata* Nutt.—are found in the park. They are leafy, succulent, perennial herbs with ternately compound leaves, white to purple flowers in few-flowered umbels, and linear fruit. They vary in height from 6 to 18 inches and are fairly common in the Humid Transition and Canadian Zones, generally in moist soils. However, as they are not very showy or conspicuous they will rarely attract the attention of the average visitor.

Lomatium (*Lomatium* spp.). This genus is represented by two species, both inhabitants of dry soils, particularly in rocky places, of the Hudsonian and lower Arctic-Alpine Zones. They are rarely more than a few inches tall. The foliage and flower stalks appear as if bunched or growing from a central point, as there is no visible stem.

Lomatium angustatum (C. & R.) St. John may be recognized by its parsley-like leaves and white flowers in compound umbels. *Lomatium triternatum* (Pursh.) C. & R. has yellow flowers in umbels, and the leaflets, instead of being incised and parsley-like as in the case of the foregoing

species, are linear-lanceolate in outline and triternate—a character which accounts for its specific name. Also called hog fennel.

Hesperoginia (*Hesperoginia stricklandi* C. & R.). A small, tufted plant with a stout root, no apparent stem, yellow flowers, and long-stemmed 2 to 3 compound leaves; the leaflets oblong and acute. It is found in dry soils of the Hudsonian Zone and is known to occur only upon Mount Rainier.

Common cowparsnip (*Heracleum lanatum* Michx.). A tall, stout-stemmed plant (2 to 4 feet high) covered with fine silky white hairs and having large ternately compound leaves and broad umbels of white flowers. The leaflets are round to heart-shaped in outline and 2 to 8 inches broad, irregularly lobed, and with the margins irregularly toothed; the fruit is heart-shaped and attached at the pointed end. This plant is widely distributed in the park, being abundant in moist to well-drained soils of the Hudsonian and upper Canadian Zones.

Angelica (*Angelica* spp.). This genus is represented in the park by two species—*A. genuflexa* Nutt., and *A. lyalli* Wats.). They are stout plants with large umbels of white flowers, and are often found in moist places in the Canadian and Hudsonian Zones, such as along streams or in swampy or marshy locations. They may be confused with the cowparsnip which they resemble superficially, but in the case of angelica the compound leaves are 3-branched and then twice pinnate.

Waterhemlock (*Cicuta* spp.). This genus is represented in the park by two species—(*C. vagans* Greene, and *C. douglasi* (DC) C. & R.). Both are common plants of very wet to swampy soils and often the roots and lower portion of the stem are submerged in water. Both are poisonous if eaten. The leaves are pinnately compound and the flowers are small, white, and in fair-sized umbels. They are from 18 to 36 inches tall. *Cicuta vagans* is very common in swampy locations near Longmire.

DOGWOOD FAMILY (CORNACEAE)

This family is represented by three species, all of the genus *Cornus*. One of these is a beautiful tree, the second is a shrub, and the third is a common and beautiful herbaceous plant.

Pacific dogwood (*Cornus nuttalli* Aud.). While common at the lower elevations in the Puget Sound region, this beautiful tree is rarely noted in the park except in the region of Ohanapecosh Hot Springs. It grows to be 20 to 40 feet tall; the leaves are 3 to 4 inches long, ovate in outline, acute, and opposite. The flowers are the striking feature of this tree. These are small, green, and arranged in head-like clusters which are in turn surrounded by 5 to 6 large, cream-colored or white, showy, petal-like bracts. The fruit is a bright shiny red.

Redosier dogwood (*Cornus stolonifera* Michx.). This is a much-branched tall shrub found occasionally at the lower elevations of the park. The leaves are opposite, ovate in outline, and acute; dark green upon the

upper surface and light green below. The flowers are small, white, and borne in open cymes instead of heads. The plant is from 6 to 12 feet tall.

Bunchberry dogwood (*Cornus canadensis* L.). One of the most common and beautiful plants of the deeply wooded Canadian Zone. It is a perennial and grows to a height of 4 to 6 inches. The leaves, borne near the top of the stem, seem to be arranged in a whorl. They are ovate in outline, acute, sessile, and from 1 to 2 inches long. The flowers are small, green, and arranged in a compact head which is surrounded by four to six white petal-like bracts. In the late summer the plant is characterized by bunches of conspicuous bright red berries. Also known as Canadian dogwood and bunchberry.

HEATH FAMILY (ERICACEAE)

A large and diversified family which includes many of the most beautiful, interesting, and common flowers in this national park. Saprophytic as well as nonsaprophytic plants are included; many species are evergreen and both herbaceous and woody plants are numbered among the members of this family. A field key follows:

1. Herbs 2
1. Shrubs or trees 8
2. Saprophytic plants, no green coloring matter 3
2. Non-saprophytic, having green foliage 6
3. Petals separate or none 4
3. Petals present and united 5
4. No petals present; stem streaked with red and white

Barber-pole (*Allotropa virgata*) (p. 124)
4. Petals present *Indianpipe* (*Monotropa* spp.) (p. 124)
5. Stout-stemmed, plant not hairy, 1½ to 8 inches tall

Cone plant (*Newberrya congesta*) (p. 125)
5. Plant hairy, 12 to 36 inches tall

Woodland pinedrops (*Pterospora andromeda*) (p. 125)
6. Flowers borne in corymbs . . . *Pipsissewa* (*Chimaphila* spp.) (p. 125)
6. Flowers in racemes or solitary 7
7. More than 1 flower upon each stalk . . *Pyrola* (*Pyrola* spp.) (p. 125)
7. Flowers single on each stalk. . *Woodnymph* (*Moneses uniflora*) (p. 126)
8. Tree, 20 to 30 feet tall, 3 to 6 inches in diameter, with smooth, ex-foliating, reddish bark; leaves oval, evergreen, shiny, thick, and leathery. Flowers white, in a panicle; berries orange-red

Pacific madrone (*Arbutus menziesi*) (p. 129)
8. Shrubs, not trees 9

9. Petals separate and leaves alternate
Labradortea ledum (*Ledum groenlandicum*) (p. 126)
9. Petals united, leaves opposite or alternate 10
10. Corolla wheel-shaped or bell-like, but open and spreading . . . 11
10. Corolla urn-like to bell-shaped or ovate 12
11. Leaves opposite, flowers purplish-red . *Kalmia* (*Kalmia* spp.) (p. 126)
11. Leaves alternate, flowers cream-white
Cascades azalea (*Rhododendron albiflorum*) (p. 127)
12. Low heath-like shrubs with small, narrow, evergreen leaves . . . 13
12. Not heath-like and leaves broad 15
13. Leaves scale-like and imbricated
Mertens cassiope (*Cassiope mertensiana*) (p. 127)
13. Leaves not scale-like or imbricated but needle-like and spreading . 14
14. Plant matted; corolla white; plant rare
Alaska heath (*Harrimanella stelleriana*) (p. 127)
14. Plant not matted; corolla red or yellow; a common genus of plants
in the park. *Mountainheath* (*Phyllodoce* spp.) (p. 127)
15. Leaves deciduous (except in evergreen huckleberry) 16
15. Leaves evergreen 17
16. Flowers in terminal corymbs or clusters; fruit dry
Rusty menziesia (*Menziesia ferruginea*) (p. 127)
16. Flowers generally solitary; fruit a fleshy berry (one species ever-
green). *Blueberry* (*Vaccinium* spp.) (p. 128)
17. Flowers in racemes or single in leaf axils
Wintergreen (*Gaultheria* spp.) (p. 128)
17. Flowers in terminal racemes or clusters
Manzanita (*Arctostaphylos* spp.) (p. 129)

Barber-pole (*Allotropa virgata* T. & G.). This saprophytic plant is distinctive in its striped red and white markings and is fairly common in the coniferous woods of the Humid Transition and lower Canadian Zones. It grows to be 6 to 12 inches tall with a stout, erect, simple stem from quarter of an inch to three-quarters of an inch in diameter. The leaves are scale-like and numerous, and the flowers (without petals) are in a crowded, short spike.

Singleflowered Indianpipe (*Monotropa uniflora* L.). This saprophytic plant is found in the deep moist woods below 2,500 feet. The rather stout, erect stems generally occur in clusters, are from 4 to 10 inches tall, and bear solitary white bell-like flowers about one-quarter of an inch to three-quarters of an inch long. Tips of the petals are sometimes edged with black, and upon drying the plant turns black. The common name above

refers to the shape of the flowers which are borne singly upon the stem; another common name—ghost plant—refers to the white color.

Manyflowered Indianpipe (*Monotropa hypopitys* L.). This saprophyte is very common in the deep woods of the Humid Transition and Canadian Zones up to about 4,000 feet. The entire plant is yellowish to red in color, with stout, erect, simple stems, often clustered, bearing from 3 to 20 bell-like flowers near the apex in a raceme.

Cone plant (*Newberrya congesta* Torr.). A rare saprophytic plant in the park and one with which many persons are unfamiliar, yet it will be readily recognized by the crowded, or congested, nature of the flowers, which accounts for the common and specific names. It is a stocky, simple-stemmed, fleshy-white to faint pink plant of the Humid Transition and Canadian Zones, and may be encountered up to an elevation of 3,500 feet. It is from 4 to 8 inches tall, with numerous scale-like and imbricated oval to oblong leaves, and numerous tubular, urn-shaped flowers borne in a crowded raceme near the top of the short stem.

Woodland pinedrops (*Pterospora andromeda* Nutt.). This saprophytic plant is quite common in the deep forests of the Humid Transition and Canadian Zones. The erect, stout, stems, quarter of an inch to half an inch in diameter and 12 to 36 inches tall, are reddish-purple and glandular hairy. The leaves are brownish, scale-like, and from quarter of an inch to 1 inch long. The flowers are pink to white in color, urn-shaped and nodding from the stems, an inch or more in length, and borne in an elongated raceme.

Common pipsissewa (*Chimaphila umbellata* (L.) Nutt.). One of the most common and beautiful plants of the deep woods of the Canadian Zone. It is from 6 to 12 inches tall, with thick, leathery, evergreen leaves, three-quarters of an inch to 1½ inches long, that are widest near the tip and taper toward the base. The edges of the leaves are toothed. Four to eight cup-shaped pink flowers, about quarter of an inch in diameter, are borne in a terminal corymb.

Menzies pipsissewa (*Chimaphila menziesi* (R. Br.) Spreng.). Not as common as the princespine and considerably smaller, being from 4 to 6 inches tall. The leaves are ovate to oblong (widest toward the base) in outline, toothed, evergreen, and leathery in texture. The white to pink flowers are in 1- to 3-flowered corymbs.

Pyrola (*Pyrola bracteata* Hook.). A common plant of the deep woods of the Humid Transition and Canadian Zones. The leaves are all basal, have long stems, are leathery in texture, ovate in outline, and have numerous rounded teeth upon the margin. From this group of basal leaves arises an erect stalk, 8 to 16 inches tall, which bears a raceme of numerous pink to reddish flowers about quarter of an inch in diameter.

Sidebells pyrola (*Pyrola secunda* L.). This is quite a common plant of the deep woods of the Canadian Zone and can be readily recognized by its

short raceme of white flowers that grow from one side of the erect flower stalk. The ovate leaves, while not basal, are most numerous along the base of the stem. The margins of the leaves have numerous rounded teeth. The flower stalk is 4 to 10 inches tall. Also known locally as one-sided pyrola.

Green pyrola (*Pyrola chlorantha* Sw.). This plant may be recognized by the dull circular leaves with long stems and a short raceme of 3 to 10 greenish-white flowers. The plant grows to be 4 to 8 inches tall and is occasionally noted in the deep woods of the Canadian Zone.

While the above are the most common of the pyrolas, there are 5 additional species. *Pyrola aphylla* Smith may be recognized by the plant's general red color and the absence (with the exception of 1 or 2 small green leaves that may be present) of leaves—these being reduced to bracts. It has a loose raceme of from 10 to 20 pink flowers and is from 4 to 8 inches tall. *Pyrola picta* Smith has a central flower-bearing stem 6 to 14 inches tall, and basal green leaves, the veins of which are white-bordered. *Pyrola dentata* Smith has oblong to lanceolate leaves and white flowers. *Pyrola uliginosa* T. & G. has broadly ovate thin leaves that are dull rather than shiny. *Pyrola minor* L. is a rare plant with small leaves half an inch to 1 inch long and white or pinkish flowers.

Woodnymph (*Moneses uniflora* L.). A small uncommon plant from 2 to 4 inches tall whose single white to pinkish flower readily accounts for the local common name of single beauty. The leaves, in pairs or whorls near the base of the stem, are round to obovate, quarter of an inch to three-quarters of an inch long, with the margins characterized by small rounded teeth.

Labradortea ledum (*Ledum groenlandicum* Oeder.). An erect shrub from 4 to 6 feet tall, rather common in boggy places in the Canadian Zone, such as the Longmire meadow. The leaves are alternate, evergreen, dark green on the upper side and covered with a rusty brown woolly pubescence underneath. In outline the leaves are narrowly oblong, 1½ to 2½ inches long, and the margins are curled under. The small, white flowers are borne in rather dense corymbs at the ends of the branches.

Bog kalmia (*Kalmia polifolia* Wang.). When in bloom, this is a showy plant with evergreen leaves and purplish flowers. It grows in very wet to boggy soils up to about 4,000 feet. The oblong leaves are about an inch or less in length and the flowers measure about quarter of an inch to half an inch in diameter and are borne in simple corymbs.

Alpine bog kalmia (*Kalmia polifolia* Wang. var. *michrophylla* (Hook.) Rehder). This is a small plant, fairly common in the very wet to boggy soils of the Hudsonian Zone, and pretty much of a "pocket edition" of the bog kalmia noted above. It rarely exceeds 10 inches in height and the leaves are not more than three-quarters of an inch long with margins usually inrolled, and usually much shorter than those of the bog kalmia. The showy purple flowers are quarter of an inch to half an inch in diameter.

Cascades azalea (*Rhododendron albiflorum* Hook.). A large, erect bushy shrub, 3 to 6 feet tall, with showy creamy-white flowers (three-quarters of an inch to 1 inch in diameter across the top) in small clusters of from 1 to 3 blossoms. The leaves are oblong in outline, generally broader above the middle and from 1 to 2½ inches long. This is a very common plant in the upper Canadian and lower Hudsonian Zones (4,500 to 5,200 feet).

Mertens cassiope (*Cassiope mertensiana* (Bong.) G. Don.). One of the common and most beautiful plants of the Hudsonian meadows. It is a much-branched low shrub from 8 to 16 inches tall, with small, oblong, scale-like and imbricated leaves and small white bell-like flowers borne singly at the apex of slender flower stalks. It occurs in small clumps and sometimes over rather extensive areas in the Hudsonian meadows.

Alaska heath (*Harrimanella stelleriana* (Pall.) Coville). A rare plant of the Hudsonian Zone. It is a small, low, matted shrub with numerous small, narrowly oblong leaves and small, white, bell-like flowers borne singly at the ends of branches.

Red mountainheath (*Phyllodoce empetriiformis* (Smith) D. Don.). One of the most common plants of the Hudsonian meadows, where it often grows over rather extensive areas making a showy display when in bloom. It is a much-branched evergreen shrub, 1 to 2 feet tall, with numerous linear, needle-like leaves and red (sometimes purplish-red) bell-like flowers in umbelliferous clusters. Known locally as red heather.

Cream mountainheath (*Phyllodoce glanduliflora* (Hook.) Coville). A plant of the upper Hudsonian and lower Arctic-Alpine Zones, 6 to 18 inches tall, with short linear needle-like leaves and pale yellow, urn-shaped flowers. Known locally as yellow heather.

Rusty menziesia (*Menziesia ferruginea* Smith). An erect shrub from 3 to 6 feet tall, much-branched and with the branches falsely whorled. Leaves deciduous, three-quarters of an inch to 2 inches long, with the widest part above the middle. The flowers are reddish-yellow, bell-like, and borne in corymbs or umbels at the ends of the previous year's branches. This plant is quite common in the upper Canadian Zone from 4,000 to 5,000 feet. It resembles the huckleberries but can be readily distinguished from those plants by the fact that its fruit is dry rather than fleshy (which accounts for the local common name of fool's huckleberry) and its flowers are borne in clusters rather than singly as is generally the case with *Vaccinium*.

Delicious blueberry (*Vaccinium deliciosum* Piper). A common, low shrub of the Hudsonian meadows, 4 to 12 inches tall, with numerous round branches. The leaves are three-quarters of an inch to 1 inch long. The pink globular flowers are borne singly in the leaf axils and the berries are black and sweet.

Big whortleberry (*Vaccinium membranaceum* Dougl.). A shrub 3 to 5 feet tall, with ovate acute leaves half an inch to 2 inches long that have very

finely toothed margins. The flowers are borne singly and are yellowish. The berry is large, black or dark wine colored, and delicious. This plant is common at elevations between 4,500 to 5,500 feet and is the most sought-after of all huckleberries for pies and jellies.

Red whortleberry (*Vaccinium parvifolium* Smith). This plant is found in the Humid Transition and lower Canadian Zones and is very common. It is from 3 to 6 feet tall, with green sharp-angled branchlets and oblong entire leaves from quarter of an inch to three-quarters of an inch long. The globular, pinkish flowers on slender, recurved stalks are solitary in the leaf axils. The berry is bright red.

Grouse whortleberry (*Vaccinium scoparium* Leiberg). This is found in the upper Canadian Zone up to an elevation of about 5,000 feet. It is a low shrub, 6 to 15 inches tall, with numerous green, angled branches and bright green leaves (quarter of an inch to half an inch long) with toothed margins. The flowers are solitary, globular, and pinkish.

Ovalleaf whortleberry (*Vaccinium ovalifolium* Smith). A plant of the Canadian Zone. It is from 3 to 6 feet tall, with branches only slightly angled and oblong leaves (three-quarters of an inch to 2 inches long) which are either nearly entire or with the margins having small teeth. The flowers are pink, urn-shaped, and borne solitary in the leaf axils. The berries are black.

Westernbog blueberry (*Vaccinium occidentale* Gray). A plant of the Canadian Zone, about 3 feet or less tall. The small flowers are mostly solitary, but occasionally occur in clusters of 2 to 4 blossoms. The berry is black.

Box blueberry (*Vaccinium ovatum* Pursh.). A leafy, much-branched shrub, 3 to 4 feet tall, also known as evergreen huckleberry. The evergreen leaves are oblong-lanceolate, dark green and shiny on the upper surface, have toothed margins, and are from half an inch to three-quarters of an inch long. The pink flowers are in short crowded racemes borne in the leaf axils. The berry is black. This plant is not common and is characteristic of the Humid Transition Zone.

Salal (*Gaultheria shallon* Pursh.). This is one of the most common plants in the lower elevations. It has woody stems, is from 1 to 3 feet tall, and is bushy to sprawling. The leaves are leathery, shiny green above, lighter on the under side, 1 to 4 inches long, with the margins toothed and ovate-oblong in outline. It is evergreen. Many white to pink urn-shaped flowers are borne in racemes and the fruit is a dark purple berry nearly as large as a Concord grape.

Oregon wintergreen (*Gaultheria ovatifolia* Gray). A plant of the upper Canadian Zone, with trailing or sprawling stems 4 to 6 inches long. The leaves are ovate in outline and acute, half an inch to 1¼ inches long and have toothed margins. The flowers are borne singly in the axils of the leaves and the fruit is a brilliant red berry. A third species—*Gaultheria*

humifosa (Graham) Rydb.—is similar to *G. ovatifolia* but the leaves are smaller.

Woolly manzanita (*Arctostaphylos tomentosa* (Pursh.) Lindl.). A much-branched woody shrub, 3 to 6 feet tall, with alternate, leathery, dull green evergreen leaves that are oblong-ovate in outline and cuspidate. The young twigs are grey-hairy. The white flowers are urn-shaped and in terminal racemes. The fruit is fleshy, greenish and marked with rose. This plant is quite common in the lower Stevens Canyon area.

Bearberry (*Arctostaphylos uva-ursi* (L.) Spreng.). A much-branched prostrate woody plant with red branches that often forms dense mats in rocky soils. The leaves are half an inch to 1 inch long, ovate but widest above the middle, leathery in texture, and evergreen. The pink flowers are in short terminal racemes and the fruit is bright red and berry-like. This plant is widely distributed in the park and occurs at elevations from 2,500 to 6,000 feet, principally on rocky locations. A third species—*Arctostaphylos nevadensis*—is also a much-branched prostrate shrub, but it has smaller ovate leaves about half an inch long with a short, slender, pointed tip. The stems are also much more red than those of the bearberry. It is not common but fairly widely distributed.

Pacific madrone (*Arbutus menziesi* Pursh.). This plant has not been found in the park. However, during the summer of 1937 a specimen was found just outside the park's southeastern boundary (near Ohanapecosh Hot Springs at an elevation of about 1,600 feet) and it is possible that one or two may be growing within park boundaries. This interesting tree is quite common in the Puget Sound area and can be readily recognized by its smooth reddish bark, glossy dark green evergreen foliage of leathery texture, and its clusters of small urn-shaped white to pinkish flowers (which will be noted in the spring), or its clusters of bright red berries (which are characteristic in late summer and early fall).

PRIMROSE FAMILY (PRIMULACEAE)

Jeffrey shootingstar (*Dodecatheon jeffreyi* Van Houtte). This is a very common plant in wet to marshy soil in the Hudsonian Zone. It has broad basal leaves, 6 to 8 inches long, that are spatulate in outline and have shallow rounded teeth upon the margin. The succulent, leafless flower stems are 8 to 16 inches tall and bear several nodding, purple flowers at the apex. These flowers are characterized by recurved petals and pointed anthers which account for the common name.

Smooth douglasia (*Douglasia laevigata* Gray). This low, tufted plant is rare in the park. It has very small oblong-lanceolate basal leaves and red flowers borne in small clusters.

Western starflower (*Trientalis latifolia* Hook.). A very common plant in moist soils in the deep woods at the lower elevations. It has a slender, simple stem, 4 to 12 inches tall, which bears a whorl of thin leaves 1 to

3 inches long. The small star-like, pinkish flowers are borne singly upon very slender stalks which arise from the leaf axils.

Upland starflower (*Trientalis arctica* Fisch.). Found in boggy soils in the Canadian Zone, such as in the Longmire meadow. The stem is 2 to 4 inches tall having a few small alternate ovate leaves below the whorl of obovate leaves at the apex. The leaves in the whorl are half an inch to three-quarters of an inch long. The flowers are white and star-like, about half an inch in diameter, and borne singly upon slender stems arising from the whorl of leaves at the stem apex.

GENTIAN FAMILY (GENTIANACEAE)

Rainier pleated gentian (*Gentiana calycosa* Griseb.). A very common and handsome plant of the Hudsonian meadows, particularly in moist soils. The stems are erect and tufted, 4 to 8 inches tall, with several pairs of leaves which are ovate in outline. The flower is deep blue, upright, bell-shaped, and 1 to 1½ inches long.

BOGBEAN FAMILY (MENYANTHACEAE)

Bogbean (*Menyanthes trifoliata* L.). A plant of boggy places in the Humid Transition and lower Canadian Zones. This plant is characterized by thick creeping rootstocks and 3-foliate leaves having long succulent stems. The leaflets are 1 to 2 inches long and obovate in outline. The numerous white to pinkish flowers are borne in a raceme at the top of a succulent, naked stem.

DOGBANE FAMILY (APOCYNACEAE)

Spreading dogbane (*Apocynum androsaemifolium* L.). This plant is 12 to 36 inches tall, with opposite, ovate leaves that are half an inch to 1½ inches long, dark green above and paler below. The flowers are rose colored and borne in cymes. It will be found in poor soils at low elevations.

PHLOX FAMILY (POLEMONIACEAE)

Spreading phlox (*Phlox diffusa* Benth.). A very common and attractive plant on dry soils or rocks in the Hudsonian and lower Arctic-Alpine Zones. It is a spreading, prostrate plant that often forms extensive mats. The leaves are linear, needle-like, sharp-pointed, and clustered along the stem. The attractive flowers, which vary from white to violet in color, are borne singly at the ends of the branchlets, are generally quite numerous, and are from half an inch to three-quarters of an inch in diameter.

Nuttall gilias (*Gilia nuttalli* Gray). This plant is common in the Hudsonian meadows on dry soils. It consists of numerous tufted erect stems from 4 to 12 inches tall. The leaves appear to be linear, about half an inch long, and whorled upon the stem (actually the leaves are divided

almost to the base into 3 to 7 linear segments). The flowers are white and in a cluster at the apex of the stem.

Weed gilia (*Gilia gracilis* (Dougl.) Hook.). Often found in dry soils along roadsides. It is 4 to 12 inches tall, with a central stem having wide-spreading numerous branches that give it a tufted appearance. The leaves are numerous, sessile, lanceolate in outline, and from half an inch to 1 inch long, the lower leaves opposite and the upper, alternate. The small flowers are borne upon slender stems arising from the leaf axils. A third species—*Gilia capitata* Hook.—also grows in poor soils as a weed. It has loosely branched stems with pinnate leaves divided into several segments and clusters of pale blue flowers upon long stems.

Microsteris (*Microsteris larseni*). This plant is occasionally found in rock slides in the Hudsonian Zone. It is a loosely tufted perennial, with leaves palmately divided into three to seven lobes and with purple flowers. Another species—*Microsteris heterophylla*—is an annual and is found at the lower elevations. It is about 6 inches tall, with alternate pinnately parted leaves and purple flowers in leafy cymes at the apex of the stem.

Skunkleaf polemonium (*Polemonium pulcherrimum* Hook.). Common in the Hudsonian meadows. It is a loosely tufted plant 8 to 16 inches tall, with compound leaves having 15 to 21 leaflets about half an inch long and oblong-lanceolate in outline. The flowers are a deep blue with yellow center, funnel-shaped, and borne in open cymes.

Alpine polemonium (*Polemonium pilosum* (Greenm.) G. N. Jones). A tufted plant 2 to 4 inches tall, with compound leaves having numerous small leaflets (an eighth of an inch or less long). The funnel-shaped flowers are white to pale blue with a yellow center. A plant of the Hudsonian and Arctic-Alpine Zones in rocky locations.

Small polemonium (*Polemonium elegans* Green). A tufted plant 2 to 4 inches tall, with compound leaves having numerous small leaflets (an eighth of an inch or slightly longer). The flower is violet with a conspicuous yellow center. This plant is most common in rocky locations in the Arctic-Alpine Zone. It has a penetrating, unpleasant odor.

WATERLEAF FAMILY (HYDROPHYLLACEAE)

Waterleaf (*Hydrophyllum congestum* Wiegand). This plant occurs in moist places in the upper Canadian Zone. It is leafy, 12 to 16 inches tall, and sparsely hairy. The leaves are long-stemmed, 4 to 8 inches long, pinnately compound into from five to seven divisions, the leaflets coarsely toothed or deeply cleft. The flowers are small, white, and in dense cymose clusters borne at the apex of a long slender stalk. A second species—*Hydrophyllum tenuipes* Heller—is quite similar to the above but has violet flowers.

Smallflower nemophila (*Nemophila parviflora* Dougl.). This is a rather inconspicuous, succulent plant found in moist open places at low

altitudes. The stems, 2 to 6 inches long, are often prostrate, having opposite, 5-lobed leaves and small, white flowers borne singly at the apex of slender, elongated stems arising from the leaf axils.

Phacelia (*Phacelia nemoralis* Greene). This is a fairly common plant in dry situations, such as along roads and trails, up to about 4,500 feet. It has dull green divided leaves, dense clusters of greenish-yellow flowers, the stamens protruding beyond the petals giving the flower clusters a burr-like appearance.

Silky phacelia (*Phacelia sericea* (Graham) Gray). A small plant of the high elevations—upper Hudsonian and Arctic-Alpine Zones. It is from 2 to 6 inches tall with finely divided leaves and dense cymose head-like clusters of deep violet flowers. The plant is further characterized by being grey, with an abundance of soft silky hairs which cover the leaves and stem.

Sitka mistmaiden (*Romanzoffia sitchensis* Bong.). A small succulent plant found in moist, rocky situations in the upper Canadian and lower Hudsonian Zones. It has slender stems and thin kidney-shaped leaves, whose margins are shallowly cleft into from 7 to 11 rounded lobes. The leaves are half an inch to three-quarters of an inch wide and have long petioles. The flowers are small, white, and borne in a loose raceme.

BORAGE FAMILY (BORAGINACEAE)

Panicle bluebells (*Mertensia paniculata borealis*). A succulent, leafy plant with stout stems often in a spreading tuft 15 to 36 inches tall. The leaves are ovate in outline, acute at the tip, and from 2 to 3 inches long. The attractive, nodding, tubular, blue flowers (often pink at base) are borne in loose clusters. This plant is quite common in moist situations in the upper Canadian Zone. Locally known as *mertensia*.

Cryptantha (*Cryptantha muriculata* (A. DC) Greene). A small, inconspicuous plant of the dry soils in the Canadian Zone. Not very common. It is erect, 4 to 8 inches tall, with small white flowers in a terminal spike. It is also characterized by the presence of numerous short, silky hairs.

MINT FAMILY (LABIATAE)

Wild mint (*Mentha arvensis* L. var. *glabrata* (Benth.) Fernald). An erect, leafy plant, 8 to 16 inches tall, with 4-sided stems. The leaves are opposite, broadly lanceolate in outline, and with numerous sharp teeth on the margin. The small pale violet flowers are in dense spikes that are sessile or very short-stemmed and borne in the axils of the leaves. This plant occurs in moist situations at low elevations. A second species—*Mentha citrata* Ehrh.—has ovate leaves and flowers in terminal spikes.

Madronella (*Madronella discolor* Greene). A small, tufted plant, 6 to 15 inches tall, with small ovate leaves, half an inch to 1 inch long, and small light purple flowers in a dense terminal cluster surrounded by reddish-purple bracts.

Yerbabuena (*Micromeria chamissonis* (Benth.) Greene). This plant has slender, trailing stems 12 to 24 inches long, ovate leaves, and solitary white to light purple flowers borne in the leaf axils.

Catnip (*Nepeta cataria* L.). A weed, 12 to 36 inches tall, with a stout dense spike of white to purple flowers.

Oregon betony (*Stachys ciliata* Dougl.). A common plant in moist places. It has stout, erect, 4-sided stems that are hairy and harsh and "sandy" to the touch. The leaves are 2 to 6 inches long, opposite, ovate-oblong in outline, and with coarse, rounded teeth. The long, tubular, purple-red flowers are borne in a terminal spike.

Selfheal (*Prunella vulgaris* L. var. *lanceolata* (Barton) Fernald). This is a fairly common plant in moist soils at low elevations (up to about 4,000 feet). It is 6 to 15 inches tall, with oblong-lanceolate leaves that are largely entire and three-quarters of an inch to 2½ inches long and violet flowers in dense terminal spikes.

Henbit deadnettle (*Lamium amplexicaule* L.). A weed with purple flowers and roundish leaves.

NIGHTSHADE FAMILY (SOLANACEAE)

Black nightshade (*Solanum nigrum* L.). A rather low, spreading plant, 6 to 12 inches tall, that grows in waste places. It has ovate to triangular-shaped leaves, half an inch to 1 inch long, and five pointed, white flowers. The fruit is a black berry.

FIGWORT FAMILY (SCROPHULARIACEAE)

This is also known as the snapdragon family. It is well represented in the park and includes some very common and beautiful flowers. Both calyx and corolla are united and the corolla, in most species, is irregular in shape. A field key follows:

- 1. Anther-bearing stamens 5; leaves alternate; flowers yellow; plant 2 to 6 feet tall and densely woolly
Flannel mullein (*Verbascum thapsus*) (p. 137)
- 1. Anther-bearing stamens 4 or 2; plant usually not densely woolly; leaves alternate, opposite, or whorled 2
- 2. Leaves fern-like, corolla very irregular and peculiarly formed
Pedicularis (*Pedicularis* spp.) (p. 136)
- 2. Leaves not fern-like 3
- 3. Modified leaves (bracts) enclosing the small flowers and brightly colored (red, sometimes yellow or white)
Paintedcup (*Castilleja* spp.) (p. 134)
- 3. Flowers readily evident and not enclosed by bracts, mostly conspicuous and showy 4

4. Leaves alternate, calyx bell-like, plant tall
Common foxglove (*Digitalis purpurea*) (p. 135)
4. Leaves opposite (at least the lower ones) 5
5. Calyx 4-parted; lower leaves opposite or whorled, upper leaves alternate, corolla circular and more or less flat—not tubular
Speedwell (*Veronica* spp.) (p. 137)
5. Calyx 5-parted and tubular 6
6. Sterile stamen conspicuous and generally bearded
Penstemon (*Penstemon* spp.) (p. 136)
6. Sterile stamen not bearded or entirely absent 7
7. The fifth and sterile stamen present but reduced to a scale on the upper side of the corolla; flowers white or blue; plant small; not more than 8 inches tall . *Littleflower collinsia* (*Collinsia parviflora*) (p. 135)
7. Only 4 stamens—no fifth and sterile stamen present; plants taller than 8 inches but if not, the flower not white or blue
Monkeyflower (*Mimulus* spp.) (p. 135)

Scarlet paintedcup (*Castilleja miniata* Dougl.). An erect plant, usually with simple stems 12 to 24 inches tall having narrowly lanceolate or lanceolate-entire leaves. Bracts surrounding the flowers are 3-to-5-cleft and flaming crimson. This plant is common in the Hudsonian meadows and generally inhabits the drier soils on south and west exposures.

Magenta paintedcup (*Castilleja oreopola* Greenman). An erect plant, usually with tufted stems, 6 to 12 inches tall. Leaves cleft to about the middle into three to five narrow segments. The bracts surrounding the flower clusters are a deep reddish-purple or magenta (occasionally yellowish to white) and are, like the leaves, 3-cleft. This is the most abundant and common of the "paintbrushes" and is found in the Hudsonian meadows, generally in moist soils.

Alpine rockpaintedcup (*Castilleja rupicola* Piper). A densely tufted, somewhat hairy plant, 4 to 8 inches tall. The leaves and bracts are deeply cut into three to seven linear lobes—the bracts being a bright scarlet. This plant is found on rocky cliffs and dry pumice soils in the Hudsonian and Arctic-Alpine Zones and is particularly abundant in the vicinity of Frozen Lake near Yakima Park.

Northwestern paintedcup (*Castilleja angustifolia* Nutt.). Erect and usually clustered, 6 to 14 inches tall, and generally hairy on stems and leaves. Leaves cut into three to five narrow lobes to about the middle. Bracts broader than the leaves and also 3-to-5-cleft, with scarlet tips. This plant grows in dry rocky soils at varying altitudes.

Yellow paintedcup (*Castilleja laevisecta* Greenman). Six to 12 inches tall, with the leaves cut into 2 to 6 narrow lobes. Bracts broad, yellow, and lobed at the top. Not common. Another yellow "paintbrush"—*Castilleja indecora* Piper—is also found in the park but is not common.

Littleflower collinsia (*Collinsia parviflora* Dougl.). This is a small plant 4 to 8 inches tall, often branched at the base and spreading. The lower leaves are oblong to nearly round with short stems and with the margins occasionally toothed; the upper leaves are almost stemless, oblong to linear in outline, half an inch to three-quarters of an inch long, and sometimes in whorls. The flowers are small, tubular, 2-lipped, blue to violet and solitary upon slender stems arising from the leaf axils. This plant is found occasionally in rather dry, open places.

Common foxglove (*Digitalis purpurea* L.). A very showy plant that has been introduced into this section and has migrated into the park. It has a stout erect stem, 2 to 5 feet tall, with ovate to ovate-lanceolate leaves with toothed margins. The flowers are tubular or bell-like, white to purple, 1 to 2 inches long, and in a long drooping raceme.

Lewis monkeyflower (*Mimulus lewisi* Pursh.). This plant can be readily recognized by its large (1 to 1½ inches long) tubular, irregularly 2-lipped rose-red flowers. It is particularly common along streams and similar moist places in the Hudsonian Zone where it often forms dense clumps of succulent vegetation from 12 to 20 inches tall. The leaves are oblong-ovate and have numerous teeth along the margin.

Brewers mimulus (*Mimulus breweri* (Greene) Coville). This is a small plant, 1 to 6 inches tall, with pale red flowers, and lanceolate, entire leaves. It is found in dry soils.

Alpine yellowmimulus (*Mimulus tilingi* Regel.). The common yellow-mimulus grows along streams and in very moist situations in the Hudsonian Zone. It is 2 to 4 inches tall, with slender weak stems, small ovate leaves and showy tubular 2-lipped flowers which are three-quarters of an inch to 1 inch long and are usually borne singly upon each stem. It often forms mats over rocks bordering, or even in, small streams.

Muskplant mimulus (*Mimulus moschatus* Dougl.). This yellow mimulus owes its common name to its peculiar odor. It has hairy, slender, generally erect stems 4 to 16 inches tall with oblong-lanceolate, finely toothed leaves from 1 to 2 inches long. The tubular 2-lipped flowers are about three-quarters of an inch long and the throat is often spotted with brown. It is fairly common in moist places in the Canadian Zone.

Common monkeyflower (*Mimulus guttatus* DC.). A rather tall, slender-stemmed plant, 6 to 24 inches tall, with yellow flowers, on slender petioles, in terminal racemes. The leaves are ovate; those upon the lower portion of the stem with short petioles and those near the top sessile. This plant is common in moist places and is often found along river bars in the Canadian Zone.

Yellow mimulus (*Mimulus alsinoides* Dougl.). This is a plant of the low elevations. It has small yellow flowers less than half an inch long, and ovate leaves.

Birdsbeak pedicularis (*Pedicularis ornithorhynca* Benth.). This plant owes its common name to the irregular shape of its purple flowers—the upper lip of the flower being hood-like and arched so that it somewhat resembles the head and beak of a bird. It is 4 to 8 inches tall, and the leaves are largely basal and pinnately divided into narrow segments which are themselves slightly lobed or toothed. The flowers are borne in a dense terminal spike about 1 inch long. It is a common plant of the Hudsonian meadows.

Elephanthead pedicularis (*Pedicularis groenlandica* Retz.). The red-dish-purple flowers are borne in a dense terminal spike, with the upper portion of the corolla narrowed, elongated, and turned up at the end. The plant is from 12 to 24 inches tall, with pinnately divided leaves, the narrow lobes themselves toothed. The leaves are largely basal but a few occur upon the stem. It is a common plant in the Hudsonian meadows.

Coiled pedicularis (*Pedicularis contorta* Benth.). The pale yellow flowers are in a dense spike 2 to 4 inches long and so formed that they somewhat resemble the head of an elephant in profile—the trunk being represented by the elongated hooded upper portion of the flower. The plant is 8 to 20 inches tall, with leaves largely basal. Basal leaves long-stemmed, those arising from the flower stalk without stems, but both types divided into numerous pinnate segments which are themselves toothed. Common in the Hudsonian meadows.

Bracted pedicularis (*Pedicularis bracteosa* Benth.). This plant has tall, erect, stout stems with leaves pinnately divided into numerous long, linear segments, half an inch to 1½ inches long, which are also toothed. The flowers are a cream-white, numerous, and in a dense terminal spike. Common in the Hudsonian meadows.

Sickle-top pedicularis (*Pedicularis racemosa* Dougl.). Erect, often tufted, 12 to 30 inches tall, with alternate lanceolate leaves, their margins having small, rounded teeth. Flowers are white to tan in color, have short stems, and are borne in loose racemes.

Rainier pedicularis (*Pedicularis rainierensis* P. & W.). Leaves long petioled, pinnately divided into numerous lanceolate divisions which are themselves toothed. Leaves largely basal. Plant 6 to 12 inches tall, with cream-colored flowers.

Littleflower penstemon (*Penstemon procerus* Dougl.). A handsome plant, 8 to 24 inches tall, with blue to purple tubular flowers half an inch or less long in dense clusters on slender stalks arising from the leaf axils. The basal leaves are ovate-oblong and the upper leaves are oblong-lanceolate, with toothed margins. The anthers are not hairy.

Tolmie penstemon (*Penstemon tolmiei* Hook.). Very similar to the above, but only 2 to 4 inches tall. This species is often regarded as an alpine variety of *Penstemon procerus*.

Bush penstemon (*Penstemon fruticosus* (Pursh.) Greene). This species is 6 to 18 inches tall, growing from a branched woody base. The leaves are leathery ovate to lanceolate and generally slightly toothed. The tubular flowers are 1 to 1½ inches long, lavender or dark purple, and the anthers are very hairy.

Coast penstemon (*Penstemon diffusus* Dougl.). This plant is from 1 to 2 feet tall with ovate to oblong, acute leaves with toothed margins. The tubular flowers are blue to violet-purple and three-quarters of an inch long.

Eggleaf penstemon (*Penstemon ovatus* Dougl.). This plant is similar to *Penstemon diffusus* but is from 6 to 12 inches tall with ovate leaves having toothed margins (upper leaves sessile). The tubular flowers are purple-blue and from half an inch to three-quarters of an inch long.

Grove penstemon (*Penstemon numerosus* (Dougl.) Trautv.). Most common in open places in the Canadian Zone, it is 6 to 24 inches tall with ovate, lanceolate, acute, and toothed leaves 2 to 3 inches long. The flowers are tubular, about 1 inch long, reddish-purple, and borne in a narrow panicle. Also known locally as turtleshead.

Yellow penstemon (*Penstemon confertus* Dougl.). The cream-yellow flowers distinguish this species from the others. The plant is from 12 to 16 inches tall, with the upper leaves sessile, oblong, entire, and acute; those near the base oblanceolate, more or less obtuse and narrowed at the base to a stem. The flowers are less than half an inch long and in dense terminal clusters. This plant occurs at elevations of from 4,000 to 6,000 feet.

Cliff penstemon (*Penstemon rupicola* (Piper) Howell). A small, shrubby plant, common on rocky cliffs. It is 3 to 6 inches tall, with small ovate leaves half an inch or less in length with toothed margins. The tubular flowers are a striking scarlet and from 1 to 1½ inches in length. This plant was first described from Mount Rainier National Park.

Menzies penstemon (*Penstemon menziesi* Hook.). This resembles *Penstemon rupicola* in many respects but may be readily distinguished from that species by the purple-violet flowers. It is a small, shrubby plant, 2 to 6 inches tall, with small oblong to ovate leaves half an inch to three-quarters of an inch long. It is found on rocky cliffs in the Hudsonian and Arctic-Alpine Zones.

Flannel mullein (*Verbascum thapsus* L.). An erect plant, 3 to 6 feet tall, with stout stem. The plant is densely woolly throughout and the leaves are thick, oblong, acute, 4 to 12 inches long, and narrowed at the base. The yellow flowers, half an inch to three-quarters of an inch broad, are borne in a long, dense spike.

Cusick speedwell (*Veronica cusicki* Gray). A common plant in the Hudsonian meadows. The stems are erect and simple, 6 to 10 inches tall, with opposite ovate to oblong entire leaves. The flowers are a deep blue, quarter of an inch to three-eighths of an inch broad and flattish, not tubular, and borne in a terminal raceme. This plant often grows in clusters.

Alpine speedwell (*Veronica alpina* L.). The flowers of this plant are a lighter blue than those of the Cusick speedwell. It also grows in moist situations, often in soggy ground near small streams or rivulets. It is from 2 to 8 inches tall. The margins of the leaves sometimes have small rounded teeth.

Allen speedwell (*Veronica cusicki* Gray, var. *alleni* (Greenm.) McBride). Much like Cusick speedwell but the flowers are smaller and white, or nearly white. The three species just described are the most common species in this genus. Four others native to the park are: *Veronica arvensis* L. which has small, pale blue flowers borne singly in the axils of the leaves; *Veronica scutellata* L., a rare species, occasionally noted in swampy or boggy places, with flowers borne in axillary racemes and with linear or linear-lanceolate leaves; *Veronica americana* Schwein which also has flowers borne in axillary racemes but the leaves are oblong-lanceolate to ovate (it is found in wet places); and *Veronica humifusa* Dickson which has the leaves at the lower part of the stem.

BROOMRAPE FAMILY (OROBANCHACEAE)

Ghostpipe (*Thalesia uniflora* L. var. *minuta* (Suksd.) G. Beck.). A yellowish, parasitic herb not likely to be encountered.

BLADDERWORT FAMILY (LENTIBULARIACEAE)

Common butterwort (*Pinguicula vulgaris* L.). This plant is occasionally found on moist banks or rocks in the upper Canadian Zone. It may be generally found in the vicinity of Comet Falls. On first glance it resembles a violet, but upon closer examination the dissimilarities can be readily seen. The leaves are basal, broad, entire, soft, and somewhat fleshy. The naked, succulent flower stalks, 4 to 5 inches tall, bear at their apex a single flower, violet blue in color, conical in outline, with the lower lip longer than the upper, and with a distinct spur in back.

PLANTAIN FAMILY (PLANTAGINACEAE)

Rippleseed plantain (*Plantago major* L.). A weed with which most people are familiar. It has broadly ovate leaves 1 to 5 inches long (with three to five prominent ribs) that are arranged in a cluster or rosette upon the ground. The small flowers are in compact terminal spikes upon erect leafless flower stalks 4 to 10 inches tall.

Buckhorn plantain (*Plantago lanceolata* L.). The leaves are in a rosette or tuft upon the ground. They are 1 to 10 inches long, with three to five prominent ribs, lanceolate in outline and narrowing at the base to a rather broad leafstalk. The plant is white-woolly at base of the leafstalk. The small flowers are in terminal spikes upon erect, leafless stalks, 4 to 10 inches tall.



Figure 89.—PANICLE BLUEBELLS (*Mertensia paniculata borealis*). Lindsley Photo.



Figure 90.—SCARLET PAINTEDCUP (*Castilleja miniata*).



Figure 91.—MAGENTA PAINTEDCUP (*Castilleja oreopola*).



Figure 92.—LEWIS MONKEYFLOWER (*Mimulus lewisi*). Lindsley Photo.

Figure 93.—ELEPHANTHEAD PEDICULARIS (*Pedicularis groenlandica*).



Figure 94.—BRACTED PEDICULARIS (*Pedicularis bracteosa*).





Figure 95.—CLIFF PENSTEMON (*Penstemon rupicola*).

Figure 96.—SITKA VALERIAN (*Valeriana sitchensis*). Grant Photo.





Figure 97.—PACIFIC RED ELDER (flower) (*Sambucus callicarpa*).



Figure 98.—LONGTUBE TWINFLOWER (*Linnaea borealis*).

Figure 99.—BUTTERBUR (*Petasites speciosa*).



Figure 100.—INDIAN THISTLE (*Cirsium edule*).





Figure 102.—ASTER FLEABANE (*Erigeron salsuginosus*).



Figure 101.—WESTERN COMMON PEARLEVERLASTING (*Anaphalis margaritacea*). Lindsley Photo.



*Figure 103.—GOLD FLEABANE (*Erigeron aureus*). Lindsley Photo.*

*Figure 104.—BROADLEAF
ARNICA (*Arnica latifolia*).*



MADDER FAMILY (RUBIACEAE)

Bedstraw (*Galium*). There are four species of this genus native to the park—*Galium oreganum* Britt., *G. cymosum* Wiegand, *G. trifidum* L., and *G. triflorum* Michx. They have slender, weak, either erect or prostrate stems that are somewhat 4-angled, with linear to oblong leaves, half an inch to three-quarters of an inch long, borne in whorls (usually 4 leaves per whorl). The flowers are small, white, and borne in cymes. These plants have a variety of habitats—from dry gravelly soils to moist locations in the deep woods, and may be found up to 5,000 feet.

VALERIAN FAMILY (VALERIANACEAE)

Sitka valerian (*Valeriana sitchensis* Bong.). One of the most common plants in the Hudsonian meadows. It is from 18 to 36 inches tall, with small white to pinkish funnel-shaped flowers in dense terminal umbels. The leaves are 3-foliate (basal, occasionally simple) with leaflets ovate in outline, half an inch to 2 inches long, and the margins toothed. Another common name—mountain heliotrope—is derived from this plant's fragrant heliotrope-like odor.

BELLFLOWER FAMILY (CAMPANULACEAE)

Bluebell (*Campanula rotundifolia* L.). This plant, most common on dry banks and hillsides or in rocky locations, may be easily recognized because of its pale blue, nodding, bell-like flowers about three-quarters of an inch long. The slender, erect, and generally simple stems (occasionally branched at the base) are from 4 to 14 inches tall. The leaves are of two types—the basal ones are broadly ovate to nearly circular in outline, with slender leaf stems; the upper ones are linear, stemless, and three-quarters of an inch to 3 inches long. The flowers are generally solitary, but sometimes are borne in a loose raceme.

Bellflower (*Campanula scouleri* Hook.). This plant grows 6 to 12 inches tall and the stem is often branched. The leaves are ovate to ovate-lanceolate in outline, tapering toward the tip and base; the margins are toothed. The pale blue bell-like to funnel-shaped flowers, quarter of an inch to half an inch long, are borne in a raceme.

HONEYSUCKLE FAMILY (CAPRIFOLIACEAE)

Pacific red elder (*Sambucus callicarpa* Greene). A very common and attractive bushy shrub of the upper Transition and lower Canadian Zones. It grows to be 6 to 15 feet tall, with opposite, pinnately compound leaves; leaflets 5 to 7 in number, 2 to 4 inches long, oblong-lanceolate in outline, acute, and with the margins toothed. The numerous small white flowers are borne in panicles and the berries, which are very showy late in the summer, are a brilliant red.

Blue elder (*Sambucus glauca* Nutt.). Also tall and bushy but not as common as the red elder, being found at lower elevations. It differs from the red elder in that the flower clusters are flat-topped rather than pyramidal and the berries are blue instead of red.

Spreading snowberry (*Symphoricarpos mollis* Nutt.). A weak-stemmed shrub, 1 to 6 feet long, with oblong to oval opposite leaves (occasionally lobed but usually entire) half an inch to three-quarters of an inch long. The flowers are small, pink, bell-like, and in clusters of 1 to 6. The berries are white, which accounts for the common name. This plant is not common.

Mooseberry viburnum (*Viburnum pauciflorum* Pylaie). A shrub, 3 to 6 feet tall, with ovate to nearly circular leaves that are mostly 3-lobed and hairy beneath. The flowers are small, white, and in flat clusters. The berry is red. This plant may be found in wet situations but is rare in the park.

Longtube twinflower (*Linnaea borealis* L. var. *longiflora* Torr.). One of the most common plants of the deep woods of the Humid Transition and Canadian Zones. The small, pink, tubular, pendent flowers are borne in pairs at the apex of slender erect stems. The plant is prostrate, often covering rocks, rotting logs, etc., upon the forest floor. The plant stem has numerous erect side branches which bear leaves and flowers. Leaves are evergreen, small, obovate in outline, obtuse, and have several rounded teeth at the top. They are from quarter of an inch to half an inch long. The flowers have a delicate odor.

Bearberry honeysuckle (*Lonicera involucrata* (Rich.) Banks). A shrub, 3 to 6 feet tall, found in moist locations at the lower altitudes. The leaves are 2 to 4 inches long, oblong to ovate, and opposite. The yellow tubular flowers, about half an inch or less long, are borne in pairs upon a slender stem arising from the axils of the leaves. Each pair of flowers is surrounded by a group of bracts at the base. The fruit is a black berry.

Western trumpet honeysuckle (*Lonicera ciliosa* (Pursh.) Poir.). Also found in wet places at lower elevations. It is a climbing plant with weak, twining stems. The leaves are oval in outline, opposite, 1 to 2½ inches long, with the uppermost pairs united into round disks. The yellow to orange tubular flowers are in whorls and the fruit is an orange berry.

COMPOSITE OR SUNFLOWER FAMILY (COMPOSITAE)

This large and important family is represented by many species. It is characterized by plants which have numerous flowers borne in compact heads surrounded by one or more rows of tegules or bracts which comprise the involucre. As this family is diversified, it is often hard to distinguish the different species and, in consequence, it is difficult to prepare a field key to genera that will be satisfactory and at the same time answer the needs of the amateur botanist. For that reason the following key contains many

terms that may be unfamiliar to the novice. Their definitions will be found in the glossary (see p. 159).

1. Corollas of all flowers in the head strap-shaped; plants with milky juice	2
1. Corollas tubular in all flowers of the head or, if strap-shaped, this character present only in marginal flowers; plants without milky juice	9
2. Pappus none. <i>Common nipplewort</i> (<i>Lapsana communis</i>) (p. 151)	
2. Pappus present	3
3. Pappus of scalelike or plumose bristles	4
3. Pappus bristles never plumose	5
4. Flowers not yellow <i>Salsify</i> (<i>Tragopogon</i>) (p. 151)	
4. Flowers yellow <i>Spotted catsear</i> (<i>Hypochoeris radicata</i>) (p. 151)	
5. Heads solitary; leaves all basal	6
5. Heads several; leaves not all basal.	7
6. Akenes (fruit) rough at apex <i>Common dandelion</i> (<i>Taraxacum officinale</i>) (p. 152)	
6. Akenes smooth at apex <i>Agoseris</i> (<i>Agoseris</i> spp.) (p. 152)	
7. Akenes flattened and beaked . . . <i>Blue lettuce</i> (<i>Lactuca spicata</i>) (p. 152)	
7. Akenes not flat	8
8. Flowers purplish <i>Rattlesnakeroot</i> (<i>Prenanthus hastata</i>) (p. 152)	
8. Flowers yellow or white	9
9. Pappus with numerous soft white bristles <i>Hawksbeard</i> (<i>Crepis capillaris</i>) (p. 152)	
9. Pappus with a single row of rough bristles <i>Hawkweed</i> (<i>Hieracium</i> spp.) (p. 152)	
10. Ray flowers none; corollas all tubular	11
10. Ray flowers present	27
11. Flowers of the head not all alike; some heads having imperfect flowers	12
11. Flowers of the heads all perfect and alike.	19
12. Perfect and imperfect flowers in the same head	13
12. Staminate and pistillate flowers in different heads	17
13. Marginal flowers sterile, often larger than central ones and resembling ray flowers . . . <i>Black centaurea</i> (<i>Centaurea nigra</i>) (p. 152)	
13. Marginal flowers perfect or pistillate and fertile, not like ray flowers	14
14. Pappus short or none	15
14. Pappus of hairlike bristles	16

15. Leaves entire, or nearly so, and ovate
American adenocaulon (*Adenocaulon bicolor*) (p. 152)
15. Leaves incised or lobed; heads in a raceme or panicle
Wormwood (*Artemisia* spp.) (p. 153)
16. Bracts of pappus in one row *Butterbur* (*Petasites*) (p. 153)
16. Bracts of pappus in several rows
Cudweed (*Gnaphalium microcephalum*) (p. 153)
17. Leaves prickly; heads large *Thistle* (*Cirsium* spp.) (p. 153)
17. Leaves not prickly; heads small 18
18. Tall, erect, leafy stems, at least 8 inches tall and usually much taller, with numerous heads . *Pearleverlasting* (*Anaphalis* spp.) (p. 153)
18. Low, white-woolly plants; heads solitary or few
Pussytoes (*Antennaria* spp.) (p. 154)
19. Pappus of separate capillary bristles 20
19. Pappus not of separate capillary bristles 23
20. Flowers whitish, cream-colored, or purplish
Luina (*Luina hypoleuca*) (p. 154)
20. Flowers yellow or brownish 21
21. Involucre rotate *Fleabane* (*Erigeron* spp.) (p. 154)
21. Involucre bell-like 22
22. Heads many-flowered *Groundsel* (*Senecio* spp.) (p. 155)
22. Head 4- to 7-flowered *Rainiera* (*Rainiera*) (p. 155)
23. Pappus of numerous bristles united into a ring at the base . . . 24
23. Pappus not of bristles united into a ring 25
24. Leaves prickly *Thistle* (*Cirsium* spp.) (p. 153)
24. Leaves not prickly *Saussurea* (*Saussurea americana*) (p. 155)
25. Pappus of rigid, backwardly barbed awns
Devils beggarticks (*Bidens frondosa*) (p. 156)
25. Pappus not as above 26
26. Pappus of numerous separate, short, rigid or chaffy bristles
Smaller burdock (*Arctium minus*) (p. 156)
26. Pappus either none or of several small scales
Tarweed (*Madia exiqua*) (p. 156)
27. Pappus none 28
27. Pappus present, at least in disk flowers 31
28. Involucre scarious 29
28. Involucre not scarious *Tarweed* (*Madia exiqua*) (p. 156)
29. Receptacle naked *Chrysanthemum* (*Chrysanthemum*) (p. 156)
29. Receptacle chaffy 30

- | | |
|--|---|
| 30. Involucre narrow; rays short | <i>Yarrow</i> (<i>Achillea</i> spp.) (p. 156) |
| 30. Involucre broad; rays conspicuous | <i>Camomile</i> (<i>Anthemis arvensis</i>) (p. 156) |
| 31. Pappus not of capillary bristles | 32 |
| 31. Pappus of capillary bristles | 34 |
| 32. Receptacle chaffy | <i>Devils beggarticks</i> (<i>Bidens frondosa</i>) (p. 156) |
| 32. Receptacle not chaffy | 33 |
| 33. Tegules in 1 row and united into a cup | <i>Eriophyllum</i> (<i>Eriophyllum lanatum</i>) (p. 156) |
| 33. Tegules in 2 or 3 rows | <i>Hulsea</i> (<i>Hulsea nana</i>) (p. 156) |
| 34. Ray flowers not yellow | 35 |
| 34. Ray flowers yellow | 36 |
| 35. Ray flowers usually narrow and numerous; tegules in 1 or 2 series and narrow | <i>Fleabane</i> (<i>Erigeron</i> spp.) (p. 154) |
| 35. Ray flowers broader, not as numerous; tegules in 2 to 5 series | <i>Aster</i> (<i>Aster</i> spp.) (p. 156) |
| 36. Heads in panicles | <i>Goldenrod</i> (<i>Solidago</i> spp.) (p. 157) |
| 36. Heads solitary or in corymbis | 37 |
| 37. Leaves all or mostly opposite | <i>Arnica</i> (<i>Arnica</i> spp.) (p. 157) |
| 37. Leaves alternate | 38 |
| 38. Heads more than half an inch broad | <i>Goldenrod</i> (<i>Solidago</i> spp.) (p. 157) |
| 38. Heads small—quarter of an inch or less broad | 39 |
| 39. Involucre bell-like | <i>Goldenweed</i> (<i>Aplopappus lyalli</i>) (p. 158) |
| 39. Involucre hemispheric | <i>Fleabane</i> (<i>Erigeron</i> spp.) (p. 154) |

Common nipplewort (*Lapsana communis* L.). This is a weed from 1 to 2 feet tall, branched at the top. The leaves at the base are ovate in outline, toothed, and sometimes lobed; upper leaves are oblong to lanceolate in outline. The flower heads are numerous and arranged in flat-topped clusters.

Common dandelion (*Taraxacum officinale* Weber). This is a common weed with which everyone is familiar. The large yellow flower heads upon naked stalks, 4 to 12 inches tall, and basal oblong to oblanceolate pinnately cleft leaves, 4 to 8 inches long, readily identify this plant.

Agoseris (*Agoseris* spp.). Five species of *Agoseris*, otherwise known as mountain dandelion, are native to the park. All are characteristic of the Hudsonian Zone and resemble the common dandelion in many respects, having large yellow to orange-yellow flower heads borne at the apex of naked stalks from 4 to 10 inches tall. The leaves are clustered at the base of the flower stalks and are either entire or pinnately cleft into numerous rather broad lobes. Native species are *Agoseris villosa* Rybd., *A. alpestris* (Gray) Greene, *A. gracilens* (Gray) Kuntze, *A. aurantiaca* (Hook.) Greene, and *A. laciniata* (Hook.) Greene.

Blue lettuce (*Lactuca spicata* (Lam.) Hitchc.). A pale green, very leafy stemmed plant from 2 to 6 feet tall, with blue to whitish flower heads in a narrow panicle. Leaves coarsely pinnately cleft, the lobes of which are themselves irregularly toothed. Not common.

Rattlesnakeroot (*Prenanthus hastata* (Less.) M. E. Jones). The triangular shaped, toothed leaves on rather long stems readily identify this plant. It grows in poor soils such as gravelly stream banks. It is 12 to 24 inches tall, leafy stemmed, and has yellow to purplish flower heads in a loose corymb.

Smooth hawksbeard (*Crepis capillaris* (L.) Wallr.). This weed has yellow flower heads in loose cymes. It is 12 to 36 inches tall, with spatulate-lanceolate leaves 2 to 6 inches long, those at the base having stems and those above being sessile and clasping at the base.

Hawkweed (*Hieracium* spp.). Five species are native to the park, all being found in more or less dry situations. They are characterized by small to medium yellow flower heads borne upon erect stems (6 to 30 inches tall) in loose panicles, though occasionally the flower heads are solitary. The leaves are entire to toothed. *Hieracium gracile* Hook. has mostly basal, oblong-spatulate entire leaves tapering to a rather broad petiole or leaf stem. The flowers are yellow. This species is common in dry Hudsonian meadows. *Hieracium albiflorum* Hook., as indicated by the specific name, has whitish flower heads, is 12 to 30 inches tall, and grows at lower elevations in the upper Canadian Zone in dry situations. In addition to the foregoing, there are three less common species—*H. cynoglossoides* A. & T., *H. fletti* St. John and Warren, and *H. cusicki* Gdr.

Centaurea (*Centaurea nigra* L.). A harsh, much-branched weed with small leaves extending almost to the flower heads. Flowers are a rose-purple and tubular, the marginal ones usually larger than those toward the center and sterile. Also known locally as Spanish buttons.

American adenocaulon (*Adenocaulon bicolor* Hook.). The rather large (2 to 5 inches long) triangular leaves with irregular, coarsely toothed mar-

gins that are green on the upper side and white woolly beneath readily identify this plant. It grows to be 12 to 36 inches tall. The leaves are mostly basal. The flower heads are very small, whitish, and borne in a loose panicle. This is a plant of open places in the woods of the Canadian Zone. It is also known locally as silver green.

Wormwood (*Artemisia* spp.). This group of plants is characterized by alternate dissected leaves and numerous small yellowish to brownish flower heads in racemes or panicles. The plants are grey-green or are white-woolly with an abundance of dense, grey, silky hairs. Five plants of this genus will be found in the park—*Artemisia birveguca* Fries. ssp. *saxitalis* (Besser) H. & C., *A. norvegica* Fries ssp. *heterophylla* (Besser) H. & C., *A. vulgaris* L., ssp. *gnaphaloides* (Nutt.) H. & C., *A. vulgaris* L., ssp. *tilési* (Ledeb) H. & C., and *A. borealis* Pall., var. *spithamea* (Pursh.) T. & G.

Alpine butterbur (*Petasites nivalis* Greene). A plant of the Hudsonian Zone along streams or other similar moist locations. It is 4 to 8 inches tall, with medium-sized white to purplish flower heads at the apex of a stout stem. Leaves are large, 2 to 4 inches long, kidney-shaped in outline with five to seven lobes which are toothed; green above and white below.

Butterbur (*Petasites speciosa* (Nutt.) Piper). This plant is generally the first to bloom in the park each season. It is common in the Humid Transition and Canadian Zones from the park boundaries to nearly 5,000 feet and may be seen along roadsides and river bars. The whitish to purplish flowers are in numerous heads at the apex of stout stems and bloom before the leaves unfold. Leaves are large (6 to 12 inches long), kidney-shaped, with seven to nine lobes, the lobes themselves toothed and green above and white below. Also known locally as coltsfoot.

Cudweed (*Gnaphalium microcephalum* Nutt.). This plant is characterized by a dense covering of soft, silky, grey hairs, linear to lanceolate leaves, and white flower heads in loose cymes. It is from 12 to 24 inches tall and grows in poor soils.

Indian thistle (*Cirsium edule* Nutt.). This plant is characterized by alternate, sessile, prickly leaves, lanceolate in outline and pinnately lobed; tall stout stems 3 to 5 feet tall; and large terminal, often clustered, purple flower heads.

Bull thistle (*Cirsium lanceolatum* (L.) Hill). This plant has stout, usually branched, stems that are somewhat woolly and 3 to 5 feet tall. The lanceolate and pinnately lobed leaves have numerous stout spines. Flower heads are large, purple, and borne on stout, leafy stalks.

Canada thistle (*Cirsium arvense* (L.) Scop.). A weed with pinkish purple flowers in corymbs. It is a much-branched plant with pinnately lobed sessile leaves that are somewhat clasping at the base. The prickles are numerous but weak.

Western common pearleverlasting (*Anaphalis margaritacea* (L.) B. & H. var. *occidentalis* Greene). A very common and widely distributed plant

with leafy stems and numerous small pearly white flower heads in a terminal corymb. It is 8 to 30 inches tall, usually tufted, and has broadly lanceolate and sessile leaves that are green above and white-woolly beneath.

Pussytoes (*Antennaria* spp.). This group of plants may be readily distinguished by the grey-woolly flower head, resembling the under side of a cat's paw. They are quite common and all are generally alike in appearance. They are rather low, white-woolly plants from 4 to 12 inches tall with alternate entire leaves and small, woolly-grey flower heads (except in *A. rosea* in which the heads are pinkish). Flower heads are in corymbs except in *A. racemosa*, in which case the flower heads are in racemes. Native species are *Antennaria lanata* (Hook.) Greene, *A. media* Greene, *A. rosea* (Eaton) Greene, *A. howelli* Greene, *A. racemosa* Hook., *A. candida* Greene, and *A. concolor* Piper.

Luina (*Luina hypoleuca* Benth.). This plant is widely distributed throughout the park from the lower elevations to the upper Hudsonian Zone and is most common on rocky soils. It may be recognized by the alternate leaves, ovate in outline (three-quarters of an inch to 1 inch long) that are dark green on the upper side and white-woolly beneath; by the leafy white hairy stems, 8 to 16 inches tall, that are generally tufted; and by the cream-colored flower heads that are borne in terminal corymbs.

Aster fleabane (*Erigeron salsuginosus* (Richards) Gray). One of the most common plants of the Hudsonian meadows. It can be readily recognized by the slender, erect stems, 12 to 24 inches tall, with the flower heads having pink to light purple rays, borne singly (occasionally more than one) at the apex. The lower leaves are spatulate to narrowly ovate in outline (2 to 6 inches long) and have stems; other leaves are sessile, oblong, and shorter. *Erigeron salsuginosus* (Richards) Gray var. *gracilis* (Nutt.) Gray is a variety of the above. *Erigeron speciosus* DC. is an attractive but uncommon plant of the Hudsonian Zone, being most generally found in the vicinity of Mount Wow in rocky soils. It is 12 to 24 inches tall, with slender stems that are leafy to the top. Leaves lanceolate and acute and from 2 to 6 inches long, the upper leaves without stems and the lower leaves with stems. Several flower heads are borne in a loose corymb at the apex of the slender stem. These are characterized by numerous (about 100) slender to almost hair-like purple to violet rays.

Gold fleabane (*Erigeron aureus* Greene). A common and attractive small plant in dry rocky or pumice soils of the Arctic-Alpine Zone. It is 2 to 6 inches tall and tufted from a stout crown with stems and leaves covered with short grey hairs. The leaves are mostly basal, obovate to spatulate in outline and with stems; the few stem leaves are lanceolate in outline and small. The flower heads, about half an inch broad, are borne singly at the apex of one to several short flower stems and are characterized by bright, golden-yellow ray flowers.

Fernleaf fleabane (*Erigeron compositus* Pursh. var. *trifidus* (Hook.)

Gray). An uncommon plant, found occasionally in rocky soils from 4,500 to 6,000 feet. It is tufted from a woody crown. Basal leaves are most numerous and have stems. The leaf blade is 3-cleft. Stem leaves are few in number and without stems. Flower heads, about half an inch in diameter, are borne singly at the apex of slender stems from 2 to 4 inches tall and are characterized by pink (sometimes white) rays. Two other varieties of *Erigeron compositus* are also found in the park—*Erigeron compositus* (Pursh.) var. *pilicaulis* St. John & Warren and *Erigeron compositus* (Pursh.) var. *multifida* (Rydb.) P. & M.

Erigeron (*Erigeron acris* L. var. *debilis* Gray). While not common, this plant is occasionally found in rocky soils in the Hudsonian Zone. It is 4 to 8 inches tall, occasionally tufted, with basal leaves spatulate-lanceolate in outline; stem leaves sessile, lanceolate in outline, and smaller. The flower heads are about half an inch in diameter, are borne singly or several in terminal clusters, and are characterized by narrow pinkish rays. *Erigeron acris* L. var. *asteroides* (Andrz.) DC., another variety found in the park, closely resembles the above.

Horseweed fleabane (*Erigeron canadensis* L.). This is an erect plant 1 to 3 feet tall, with simple stems or, if branched, with erect branches. The leaves are numerous and linear in outline (the lower leaves sometimes spatulate in outline and occasionally cleft or toothed). The flower heads are numerous, whitish, and borne in terminal panicles.

Arrowleaf groundsel (*Senecio triangularis* Hook.). A very common plant in the park, particularly in moist situations of the Hudsonian Zone but occasionally found at lower altitudes. It is from 12 to 36 inches tall, with a simple stem that is leafy to the top. The leaves are 2 to 6 inches long, triangular in outline, and with toothed margins. The flower heads are generally numerous, about half an inch in diameter, in fairly compact terminal corymbs, and characterized by bright yellow ray flowers.

Fremont groundsel (*Senecio fremonti* T. & G.). This is a plant of rocky soils of the Hudsonian Zone. The stems are tufted; often branched and erect and 4 to 8 inches high. Leaves are broadly ovate, spatulate, or oblong with toothed margins and from three-quarters of an inch to 2 inches long. The flower heads, quarter of an inch to half an inch in diameter, are one to several in a bunch (often several bunches on one plant at the apex of several branches) and are characterized by yellow rays.

Rainiera (*Rainiera stricta* Greene). A fairly common plant of the Hudsonian Zone. It has stout, leafy, erect stems 18 to 36 inches tall with numerous flower heads about half an inch in diameter in a long compact terminal raceme. The leaves are oblong-lanceolate and 6 to 12 inches long.

Saussurea (*Saussurea americana* D. C. Eaton). This plant has an erect, stout stem that is leafy to the top, 12 to 48 inches tall, with a dense cluster of small violet-blue flower heads at the apex. The leaves are ovate to

oblong-ovate with the margins toothed; lower leaves with short petiole and upper leaves without stems.

Devils beggarticks (*Bidens frondosa* L.). A much-branched weed 28 inches or less tall, with opposite, three to five divided leaves and small flower heads on slender stems which are characterized by yellow rays.

Smaller burdock (*Arctium minus* (Hill) Bernh.). A stout-stemmed, much-branched plant, 3 to 5 feet tall, with broadly ovate leaves that are woolly on the under side. Flower heads are numerous and purple.

Tarweed (*Madia exigua* (Smith) Gray). A slender-stemmed, erect (though usually branched above) plant of dry locations. The leaves are linear and from half an inch to 1 inch long. Flower heads are on long stems, yellow, and arranged in loose corymbs.

Chrysanthemum (*Chrysanthemum leucanthemum* L. var. *pinnatifidum* Lecog. & Lemotte). An erect, slender-stemmed plant 12 to 24 inches tall, with a single flower head, the rays of which are white. Basal leaves are oblong to spatulate and pinnately toothed; leaves on upper part of the stem are smaller and linear in outline.

Common yarrow (*Achillea millifolium* L.). This plant may be readily recognized by the fern-like leaves (3 to 7 inches long and pinnately divided into many segments which are themselves further divided) and flat-topped terminal clusters of small flower heads with white rays. The plant grows 12 to 36 inches tall and is quite common, particularly at the lower elevations. Two varieties that occur in the Hudsonian and, to a limited degree, in the lower Arctic-Alpine Zones are *Achillea millifolium* L. var. *alpicola* (Rydb.) Garrett and *Achillea millifolium* L. var. *fusca* (Rydb.) G. N. Jones. Both resemble the common yarrow except that they are smaller.

Field camomile (*Anthemis arvensis* L.). A much-branched weed with white flower heads and alternate leaves cut into several thread-like lobes.

Woolly eriophyllum (*Eriophyllum lanatum* (Pursh.) Forbes). An attractive but uncommon plant in the park. It is generally from 10 to 20 inches tall and has slender stems lightly covered with soft gray hairs. The leaves are 3- to 7-lobed, though occasionally lower leaves will be entire; upper side of leaves dark green and the lower surface white-woolly. The large and conspicuous flower heads are borne singly upon long stems and are characterized by large golden-yellow rays. This plant may be found most easily in the Mount Wow region.

Hulsea (*Hulsea nana* Gray). The herbage of this plant is white-woolly with mostly basal leaves that are oblong-spatulate in outline and with the margins deeply cut into irregular teeth or small lobes; the base of the leaves narrowed to a stem. The flower head is borne singly at the apex of the stem and is characterized by yellow rays. This plant is from 4 to 12 inches tall and is found in loose, dry, volcanic soil.

Purple aster (*Aster ledophyllus* Gray). A common plant in the Hudsonian meadows. The stems are generally tufted, erect, from 12 to 30 inches

tall, and leafy throughout their entire length. Leaves are lanceolate, three-quarters of an inch to 2 inches long, and dark green on the upper side and grey-green beneath. The flower heads are large, conspicuous, and handsome, usually several in a loose cyme at the top of the stem and characterized by violet rays.

Fewflower aster (*Aster modestus* Lindl.). This species grows at lower elevations than does the purple aster and is common in the woods of the Canadian Zone. It is 24 to 30 inches tall, with the stems erect and very leafy. Leaves are lanceolate in outline, toothed, and without stems. The flower heads are large and conspicuous, several being borne on slender stems at the top of the stem, and are characterized by violet rays.

Dwarf purple aster (*Aster alpigenus* (T. & G.) Gray). A common plant in the Hudsonian meadows. The leaves spread from a stout root in a sort of basal tuft and are linear-spatulate and 1 to 3 inches long. The flower stem is erect, slender, and 2 to 5 inches tall. The single large flower head at the apex is characterized by attractive violet rays.

Tall leafybract aster (*Aster foliaceus* Lindl. var. *frondeus* Gray). This plant has slender to rather stout, erect, and generally simple stems 8 to 24 inches tall. Stems are generally leafy with the lower leaves large, oblanceolate in outline, and tapering toward the base into rather broad stems; leaves on upper stem without stems. The flower heads are large, several in number at the top of the stalks upon slender stems, and with violet rays. Another variety—*Aster foliaceus* Lindl. var. *apricus* Gray—is similar to tall leafybract aster but smaller.

Mountain goldenrod (*Solidago ciliosa* Greene). This plant is quite common in the Hudsonian and lower Arctic-Alpine Zones. It is generally tufted and 4 to 12 inches tall with basal leaves oblanceolate in outline and either toothed or entire and 1 to 3 inches long, narrowing at the base to a margined leaf stem. The flower heads are numerous, small, and in dense terminal panicles with bright yellow rays.

Creek goldenrod (*Solidago elongata* Nutt.). As the specific name indicates, this plant is much taller than the mountain goldenrod, though with that exception it resembles it in many respects. The stems are tufted, 24 to 36 inches tall, with leaves that are lanceolate in outline and toothed. The flower heads are numerous in a dense panicle and with yellow rays.

Broadleaf arnica (*Arnica latifolia* Bong.). This, the most common of 13 species of arnica found in the park, is abundant in the Hudsonian meadows where it is one of the most common flowers. It has an erect, simple stem, 12 to 24 inches tall, with opposite leaves that are coarsely toothed and oval to ovate in outline (lower leaves with stems, upper leaves without stems). The flower heads are large, conspicuous, and handsome, being brown within and with bright yellow rays. In general, this genus is characterized by yellow rays and yellow-brown disk flowers and opposite leaves. The other species differ, botanically, from the common one described above

but are not enumerated here because these differences are probably of no importance to the layman. Other species which resemble the one described are *Arnica amplexicaulis* Nutt., *A. betonicaefolia* Greene, *A. macouni* Greene, *A. mollis* Hook., *A. rydbergi* Greene, *A. aspera* Greene, *A. cordifolia* Hook., *A. diversifolia* Greene, *A. gracilis* Rydb., *A. myradenia* Piper, *A. parryi* Gray, and *A. pumila* Rydb.

Goldenweed (*Aplopappus lyalli* Gray). This leafy plant grows in rocky situations in the Hudsonian Zone. It is 4 to 8 inches tall, with alternate, oblong-spatulate to oblanceolate leaves quarter of an inch to 2 inches long, and flower heads borne solitary at the apex of the flower stalks.

Glossary



- Acuminate.* Taper pointed.
- Acute.* Pointed.
- Akene.* A small, dry, 1-celled, 1-seeded, indehiscent fruit.
- Angiosperms.* Seed plants with ovules and seeds within an ovary.
- Annual.* Lasting but 1 year.
- Aril.* Exterior covering of certain seeds.
- Axil.* Angle formed by a leaf, or branch, with the stem.
- Axillary.* Occurring in the axil.
- Berry.* A pulpy, juicy fruit like a grape.
- Bi.* Two or twice, as in bipinnate.
- Biennial.* Plants enduring 2 years.
- Bipinnate.* Twice pinnate (see pinnate).
- Bract.* A much-reduced leaf.
- Calyx.* The outer series of segments of a flower (corolla is the inner series). When only one series is present it is considered as the calyx.
- Campanulate.* Bell-shaped.
- Capsule.* A dry seed pod that opens naturally.
- Catkin.* A deciduous, elongated spike of flowers as in the willow.
- Cleft.* Cut.
- Compound.* Composed of two or more parts.
- Cordate.* Heart-shaped.
- Corolla.* The series of segments within the calyx in a flower; usually very showy.
- Corymb.* A flat or convex flower cluster with branches arising from different levels on the stem and blooming from the outside toward the center.
- Crenate.* Referring to leaf margins with rounded teeth.
- Cuspidate.* With a slender, sharp point at the tip.
- Cyme.* Like a corymb, but blooming from the center toward the outside.
- Deciduous.* Referring to leaves which fall from the plant each autumn.
- Dentate.* Toothed.
- Dissected.* Cut deeply into numerous small divisions.
- Drupe.* A fruit containing a stone.
- Elliptic.* Oval or oblong.
- Entire.* Referring to leaf margins which are not toothed, notched, or divided.
- Fascicle.* A close bundle or cluster.
- Follicle.* A dry fruit similar to a pod, opening along one side only.
- Frond.* A fern leaf.
- Glabrous.* Without hairs.
- Glaucous.* Whitened with a bloom.
- Gymnosperm.* A plant with its seeds not enclosed in an ovary.
- Herbaceous.* Not woody.
- Hirsute.* With stiff hairs.
- Imbricate.* Overlapping like shingles on a roof.
- Incised.* Deeply cut.
- Indehiscent.* Said of fruits or pods which do not split open.
- Involucre.* A whorl of bracts about a flower, umbel, or flower head.
- Lanceolate.* Narrow; lance-shaped.
- Leaflet.* A division of a compound leaf.
- Linear.* Narrow, with parallel margins.
- Mucronate.* Tipped with a short, abrupt point.
- Ob.* Upside down.
- Obcordate.* Heart-shaped with the pointed end at base.
- Oblanceolate.* Lance-like but narrowing toward base.

Oblong. Several times longer than wide.
Obovate. Wider above middle.
Orbicular. Circular, or nearly so, in outline.
Ovate. Widest toward base.
Palmate. Spreading from a central point like the fingers of the hand.
Panicle. A compound raceme.
Pappus. The modified calyx-limb in the Compositae, composed of a ring, a crown of hairs, chaff or scales.
Pedicel. A flower stalk or stalk of a flower cluster.
Peduncle. A flower stalk.
Perennial. A plant that lives from year to year.
Perianth. The floral envelopes of the flower, especially when calyx and corolla cannot be distinguished.
Petiole. The stalk of a leaf.
Pinnae. The primary divisions of a fern leaf (frond).
Pinnate. Referring to leaf with several leaflets that are arranged upon opposite sides of a central axis.
Pinnules. Segments or leaflets of a pinna; the secondary division of a fern leaf (frond).
Plumose. Finely and abundantly branched, as in a plume.
Prostrate. Flat upon the ground.
Pubescent. Covered with numerous fine, soft hairs.
Raceme. A flower cluster in which several to many flowers are borne upon a central axis, with each flower borne singly upon separate stems.
Recurved. Curved backward.
Reniform. Kidney-shaped.
Repand. Wavy-margined.
Revolute. Curved or rolled under and backward.

Rhizome. An elongated creeping or subterranean stem.
Rotate. Wheel-shaped.
Samara. A winged fruit, as in the maple.
Saprophyte. A plant which lives on dead organic matter, having no chlorophyll.
Scape. A peduncle (naked or without ordinary foliage) rising from the ground.
Scarious. Thin, dry, membranous, and not green.
Serrate. Toothed, the teeth pointing forward.
Sessile. Lacking a stalk or stem as in the case of leaves of some plants.
Simple. Not compound.
Sori. Clusters of sporangia which bear the spores in the case of the Pteridophytes.
Spatulate. Like a spatula; rounded above and contracted below to a slender base.
Spike. A flower cluster in which several to many flowers are borne upon a central axis, each flower, lacking a stem, being sessile upon the axis.
Sporangia. Spore-bearing parts.
Sporophyll. A spore-bearing leaf.
Stipules. Appendages on each side of the base of some leaf stems.
Stomata. Minute openings in the surface of leaves.
Tegule. One of the sepal-like bracts surrounding the head in the Compositae.
Tendril. A thread-like portion of some plants which is used in climbing.
Umbel. An umbrella-like flower cluster.
Utricle. A small bladder-like, 1-seeded fruit.

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